HEW [illegible]NG DATA ON PRIVATE REHABILITATION OF DISABLED

The Office of Vocational Rehabilitation has made a grant of $5,300 for a survey of expenditures by private voluntary agencies for rehabilitation of the disabled. The grant went to the National Rehabilitation Association. The Department of Health, Education, and Welfare wants the information in order to determine what the government effort for meeting the problem should be.

OVR is spending $57,600,000 for rehabilitation this year, and state agencies are prepared to spend about $28,300,000. "If we are to plan soundly for the future, the governmental agencies should know how much of the job can and will be done by the private agencies and the voluntary organizations, in turn, should know just what the federal and state agencies are prepared to do, "Secretary Flemming said.

"In that way we should be able to arrive at a reasonable and equitable division of the costs and at the same time develop more efficiency in operations through prevention of overlapping activities. This should benefit all concerned—the handicapped, the taxpayer, and the contributing public."

NATIONAL HEALTH SURVEY REPORTS ON AGED

New figures gathered by the National Health Survey show that of [illegible]7 million middle-aged people, 14,800,000 reported no long-term chronic illness. Further, 3,600,000 out of 15 million persons 65 years or older also reported no chronic condition.

The survey, started over 15 months ago, shows there is a progressive increase in the incidence of chronic illness and disability as persons get older. The existence of one or more chronic health conditions was reported for one-sixth of children, one-third of youth, one-half of 50 million young adults, three-fourths of those in middle age, and three-fourths of those who are 65 years or older.

"Fortunately, not all chronic conditions are disabling," according to Bertha Adkins, Under Secretary of HEW, "but they do impose some limitations on the activities of more than 6 million middle-aged people and on 6,300,000 persons 65 or more years of age. Among the older group, about 2,250,000 are unable to carry on their major activities of living."

MISCELLANY

A month-long course in "Principles of Medical Operations in Nuclear Warfare" is under way at Walter Reed Army Institute of Research, Washington, D. C. In attendance are 23 Army medical officers from stations throughout the world. The objective is to teach the principles involved in medical phases of nuclear war, including a review of mathematics and theory, nuclear weapons systems, phenomenology and human effects and medical plans, training, and applications. Lieut. Col. Joseph D. Goldstein is director of the course.

Col. Floyd L. Wergeland, director of the Office for Dependents' Medical Care (Medicare) has been promoted to brigadier general. He succeeded Major Gen. Paul I. Robinson in the post last September.

one
glycoside
consistently
reliable for

- routine or emergency digitalization
- long-term maintenance

with the added benefits of

- early gastrointestinal warnings of over-digitalization
- short duration of toxicity if over-digitalization occurs

'LANOXIN' TABLETS
0.25 mg. scored (white)
0.5 mg. scored (green)

'LANOXIN' INJECTION
0.5 mg. in 2 cc. (I.M. or I.V.)

'LANOXIN' ELIXIR PEDIATRIC
0.05 mg. in 1 cc.

'LANOXIN'®
brand
DIGOXIN

formerly known as Digoxin 'B.W. & Co.'

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, New York

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. F. J. L. Blasingame, 535 North Dearborn St., Chicago 10, Executive Vice President.

1958 Clinical Meeting, Minneapolis, Dec. 2-5.
1959 Annual Meeting, Atlantic City, June 8-12.
1959 Clinical Meeting, Dallas, Texas, Dec. 1-4.
1960 Annual Meeting, Miami Beach, Fla., June 13-17.
1960 Clinical Meeting, Washington, D. C., Nov. 29-Dec. 2.
1961 Annual Meeting, New York City, June 19-23.
1961 Clinical Meeting, Denver, Nov. 28-Dec. 1.

AMERICAN

November

American Association of Blood Banks, Netherlands Plaza Hotel, Cincinnati, Nov. 20-22. Dr. John B. Alsever, 1211 W. Washington, Phoenix, Ariz., Secretary.

American College of Cardiology, Interim Meeting, Jung Hotel, New Orleans, La., Nov. 20-22. Dr. Philip Reichert, Empire State Bldg., New York 1, Secretary.

Association of Military Surgeons of the U. S., Hotel Statler, Washington, D. C., Nov. 17-19. Col. Robert E. Bitner, 1726 Eye St., N. W., Washington 6, D. C., Secretary.

District of Columbia, Medical Society of the, Hotel Statler, Washington, Nov. 24-26. Mr. Theodore Wiprud, 1718 M St., N. W., Washington 6, Secretary.

International College of Surgeons, Mid-Atlantic Sectional Meeting, The Homestead, Hot Springs, Va., Nov. 16-18. Dr. E. G. Gill, 711 S. Jefferson St., Roanoke, Va., Chairman.

National Society for Crippled Children & Adults, Statler Hilton Hotel, Dallas, Tex., Nov. 16-20. Miss Catharine Bauer, 11 S. LaSalle St., Chicago 3, Director of Information.

Puerto Rico Medical Association, Santurce, P. R., Nov. 18-22. Mr. J. A. Sanchez, Box 9111, Santurce 29, P. R., Executive Secretary.

Radiological Society of North America, Palmer House, Chicago, Nov. 16-21. Dr. Donald S. Childs, 713 E. Genesee St., Syracuse 2, N. Y., Secretary.

Southern Thoracic Surgical Association, Deauville Hotel, Miami Beach, Fla., Nov. 28-30. Dr. Hawley H. Seiler, 517 Bayshore Blvd., Tampa 6, Fla., Secretary.

United States Section, International College of Surgeons, Mid-Atlantic Regional Meeting, The Homestead, Hot Springs, Va., Nov. 17-18. For information address: Dr. Elbryne G. Gill, 711 Jefferson St., S., Roanoke 13, Va.

Western Surgical Association, Kahler Hotel, Rochester, Minn., Nov. 20-22. Dr. John T. Reynolds, 612 N. Michigan Ave., Chicago 11, Secretary.

December

American Academy of Dermatology and Syphilology, Palmer House, Chicago, Dec. 6-11. Dr. R. R. Kierland, Mayo Clinic, Rochester, Minn., Secretary.

American Medical Association Clinical Meeting, Hotel Leamington, Minneapolis, Dec. 2-5. Dr. F. J. L. Blasingame, 535 N. Dearborn St., Chicago 10, Executive Vice President.

American Rheumatism Association, Mayo Clinic, Rochester, Minn., Dec. 6. Dr. Edward F. Hartung, 580 Park Ave., New York 21, Secretary.

Association for Research in Nervous and Mental Diseases, Hotel Roosevelt, New York, Dec. 12-13. Dr. Rollo J. Masselink, 700 W. 168th St., New York 32, Secretary.

Mid-West Forum on Allergy, Sheraton-Cadillac Hotel, Detroit, Dec. 6-7. Dr. John M. Sheldon, University Hospital, Ann Arbor, Mich., General Chairman.

Southern Surgical Association, Boca Raton Club & Hotel, Boca Raton, Fla., Dec. 9-11. Dr. George G. Finney, 2947 St. Paul St., Baltimore 18, Md., Secretary.

AMERICAN

1959

January

American Academy of Orthopaedic Surgeons, Palmer House, Chicago, Jan. 24-29. Dr. Clinton L. Compere, 720 N. Michigan Ave., Chicago 11, Secretary.

American Protestant Hospital Association, Jefferson Hotel, St. Jan. 27-30. Mr. Olin E. Oeschger, 740 Rush St., Chicago 11, Secretary.

American Society for Surgery of the Hand, Palmer House, Chica Jan. 23-24. Dr. George S. Phalen, 2020 E. 93d St., Cleveland Secretary.

International College of Surgeons, Southeastern Regional Meeting, Miami Beach, Fla., Jan. 4-7. Dr. Harold O. Hallstrand, 7210 Road, South Miami, Fla., Chairman.

International Medical Assembly of Southwest Texas, Gun Hotel, San Antonio, Tex., Jan. 26-28. Mr. S. F. Cockrell Jr., W. French Pl., San Antonio, Tex., Executive Secretary.

Rocky Mountain Traumatic Surgical Association, Aspen, Colo., J 28-31. Dr. Charles B. Barnell, 1600 Orange Ave., Long Beach 13, Cal Secretary.

Western Society for Clinical Research, Carmel-by-the-Sea, Cal Jan. 29-31. Dr. William N. Valentine, University of California Medi Center, Los Angeles 24, Secretary.

February

American Academy of Allergy, Morrison Hotel, Chicago, Feb. 9-1 Dr. Bram Rose, Royal Victoria Hosp., Montreal, Quebec, Secretary.

American Academy of Forensic Sciences, Drake Hotel, Chicago, Fe 26-28. Dr. Walter J. R. Camp, 1853 W. Polk St., Chicago 12, Secretar

American Academy of Occupational Medicine, Boston, Feb. 11-1 Dr. L. Blaney, 1608 Walnut St. Philadelphia 3, Secretary.

American College of Radiology, Drake Hotel, Chicago, Feb. 6-7. M William C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Direct

California Medical Association, Sheraton-Palace Hotel, San Francis Feb. 22-25. Mr. John Hunton, 450 Sutter St., San Francisco 8, Executiv Secretary.

Colorado State Medical Society, Midwinter Clinical Session, Shirle Savoy Hotel, Feb. 17-20. Mr. Harvey T. Sethman, 1612 Tremont Pla Denver 2, Executive Secretary.

Congress on Industrial Health, Netherland Hilton Hotel, Cincinna Feb. 16-18. Dr. B. Dixon Holland, 535 N. Dearborn St., Chicago 1 Secretary.

March

Alaska Territorial Medical Association, Baranof Hotel, Junea March. Dr. Robert B. Wilkins, 1121 Fourth Ave., Anchorage, Secreta

American Broncho-Esophagological Association, The Homestea Hot Springs, Va., Mar. 8-9. Dr. F. Johnson Putney, 1712 Locust S Philadelphia 3, Secretary.

American College of Allergists, Fairmont Hotel, San Francisco, M 15-20. Dr. M. Coleman Harris, 450 Sutter St., San Francisco, Secreta

American Laryngological Association, The Homestead, Hot Sprin Va., Mar. 8-9. Dr. James H. Maxwell, University Hospital, Ann Arb Mich., Secretary.

American Laryngological, Rhinological & Otological Society, Homestead, Hot Springs, Va., Mar. 10-12. Dr. C. Stewart Nash, Medical Arts Bldg., Rochester 7, N. Y., Secretary.

American Orthopsychiatric Association, Sheraton-Palace Hotel, S Francisco, Mar. 30-Apr. 1. Dr. Marion F. Langer, 1790 Broadway, N York 19, Executive Secretary.

American Otological Society, The Homestead, Hot Springs, Va., M 13-14. Dr. Lawrence R. Boies, University Hospital, Minneapolis Secretary.

Michigan Academy of General Practice, Post-Graduate Cli Sheraton-Cadillac Hotel, Detroit, Mar. 4. Dr. F. P. Rhoades, 970 M cabees Bldg., Detroit 2, Convention Manager.

National Health Council, Palmer House, Chicago, Mar. 17-19. Philip E. Ryan, 1790 Broadway, New York 19, Executive Director

National Multiple Sclerosis Society, New York, Mar. 9. Mr. Don Vail, 257 4th Ave., New York 10, Secretary.

Southeastern Surgical Congress, Deauville Hotel, Miami Beach, Fl Mar. 9-12. Dr. Benjamin T. Beasley, 45 Edgewood Ave., S. E., Atlanta Ga., Secretary.

Southwestern Surgical Congress, New Brown Palace Hotel, Denv Mar. 30-Apr. 1. Dr. C. M. O'Leary, 1213 Medical Arts Bldg., Oklaho City, Okla., Secretary.

April

Aero Medical Association, *Hotel Statler, Los Angeles, Apr. 27-29.* I Thomas H. Sutherland, P. O. Box 26, Marion, Ohio, Secretary.

Alabama, Medical Association of the State of, Birmingham, A 9-11. Mr. William A. Dozier, 17 Moulton Bldg., Montgomery, Executi Secretary.

(Continued on page 52)

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

DR. ROBERT HEILIG LIBRARY
S. M. S. Medical College

VOL. 168, NO. 11

CHICAGO, ILLINOIS

NOVEMBER 15, 1958

COPYRIGHT, 1958, BY AMERICAN MEDICAL ASSOCIATION

ISOLATION STRESS IN MEDICAL AND MENTAL ILLNESS

Eugene Ziskind, M.D., Los Angeles

Sufficiently prolonged isolation from society or deprivation of sensory stimuli can produce mental abnormalities in the form of hallucinations, anxiety states, depression, and paranoid symptoms. Conditions likely to induce these phenomena occur clinically in patients kept in the dark after cataract operations, in persons with severe impairment of hearing, in poliomyelitic victims confined to respirators, in prisoners kept in solitary confinement, and in refugees handicapped by language difficulties. Monotony and isolation also affect certain occupational groups such as long distance truck drivers, monitors of radar screens, watchmen, and assembly-line workers. The underlying nervous mechanisms are not yet understood, but prevention and treatment are simple. This is well illustrated by the experience with cataract surgery, which in the past has been followed by psychoses in as many as 7% of cases. Since improvements of technique have permitted reduction of the period of bilateral bandaging of the eyes to one day or less, the incidence of postoperative psychosis has fallen below 1%.

THAT EXTREME isolation can produce mental abnormality has long been known to psychiatrists and social scientists. Recent experiments indicate that this reaction to isolation is universal. Does the newer knowledge aid in determining to what extent less extreme degrees of isolation are stressful in medical and mental illness? What is the mechanism of isolation stress? Can it be measured? These interrelated queries will be considered.

The early psychiatric references to isolation are to the paranoid psychoses of prisoners in solitary confinement,[1] the hard of hearing,[2] and the communication-deprived refugees.[3] Children reared in social isolation,[4] e. g., the famous case of Caspar Hauser, and those raised by animals, so-called feral men, have shown retarded mental development. Recently anecdotal accounts of isolation at the Arctic and Antarctic regions and at sea have attracted attention. Of even greater scientific interest is experimentally induced isolation.

Experimental Studies

Three experimental procedures of inducing isolation are currently best known. Each interferes with the usual sensory stimuli in a different and special way. The first report was by Heron and associates.[5] Healthy college students were paid $20 a day for as long as they would stay in a soundproof air-conditioned cubicle in a comfortable bed,

---

Clinical Professor of Psychiatry, University of Southern California School of Medicine.

Read before the Section on Nervous and Mental Diseases at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

eyes covered completely by translucent ski goggles, and arms and hands restrained with cardboard sleeves. Provision was made for food and elimination. A communication device extended to the observer who was watching on the outside through a window. Most subjects terminated the experiment within three days because of anxiety, and those who persevered longer usually developed hallucinations. The latter were commonly visual, but occasionally auditory or tactile. The second method was carried out by Lilly,[6] with the subjects isolated under water up to three hours. In the third method, Solomon and his associates[7] confined subjects up to 36 hours in a specially prepared tank-type respirator (with the motor going, but the vents open). The final results of various methods show similarities. Interference with normal sensory stimulation in the isolation experiments accounts for the rapid induction and high incidence of stress and mental disability.

Each group of investigators set out to separate the subjects from other persons and to eliminate new meaningful sensory stimuli. For each objective the attainment was not absolute. Although all three methods impose changes in the intensity, variability, and finer discriminations of sensory stimuli, each has a different emphasis. That of Hebb is characterized chiefly by a reduction in the patterning of the stimuli, that of Lilly by a reduction in the absolute level of the stimuli, and that of Solomon by an imposed, unvarying, and repetitious structuring of the stimuli. Actually an important common feature is reduction in the variability of stimuli. The altered sensory input is the focus of study in current attempts to clarify the physiological mechanisms involved.

Since the experiments are characterized by special interference with sensory input in addition to isolation, the question arises "To what extent are the effects due to seclusion and to what extent to the alteration of sensory stimuli?" Sensory deprivation is always a concomitant of isolation in man, one reason being that the human voice is such a significant part of the total external stimuli. In fact, clinical material points up that interpersonal isolation alone, without special sensory interference, also produces stress and mental symptoms.

Isolation in Medical and Mental Illness

Conditions associated with special sensory interference will be discussed first. The most striking clinical example of isolation stress is seen among patients with postoperative cataract psychoses. After extraction of the cataract, the patient has the unoperated eye covered as well as the operated one because this cuts down the ocular movements which might interfere with healing. A small number of patients develop postoperative psychoses. The ophthalmological surgeons have known that the majority of such cases clear up quickly once the unoperated eye is uncovered. There is much evidence that elimination of visual stimuli in the isolated patient may produce a break with reality and that restoration of visibility usually suffices to dissipate the hallucinations and other mental symptoms.

As long ago as 1890 Frankl-Hochwart[8] wrote that the chief factor was the "Abschliessung von der Aussenwelt." He noted that the incidence of postoperative psychoses in cataract extraction was higher than that after other types of surgery— 7% in the 183 cases of the famous ophthalmologist Schnabel (1880). He also referred to the experience of Schmid-Rimpler with two nonalcoholic patients, suffering with iridochoroiditis and luetic iritis (19 and 57 years of age, respectively), who were placed in a darkened room and developed psychotic syndromes. In the latter half of the 19th century it was customary to place cataract patients preoperatively and postoperatively in a pitch black room. Schmid-Rimpler in 1863 already commented that this practice contributed to the incidence of psychotic disturbances.

Later a series of advances in operative technique resulted in a progressive reduction of the number of days of required bilateral bandages and a corresponding diminution of the cataract postoperative psychoses. In the earliest days the incision into the eyeball was left to heal without sutures, at which time both eyes were kept covered three or four days. In this period, the incidence of psychoses, as judged by the report of Parker (1913), was 3%. Then followed the general acceptance of conjunctival sutures (probably around 1930) when two or three days of bandaging of both eyes sufficed, and the psychoses were reduced to 1.5 or 2%.[9] With the introduction of deep corneoscleral sutures (generally practiced since about 1945), the bilateral bandaging could be reduced to one day or less. Correspondingly, the complicating psychoses dropped to less than 1%.[9]

So far the evidence of an etiological role for sensory deprivation in cataract postoperative psychoses is (1) greater incidence of this complication than after other types of surgery, where sensory deprivation does not occur; (2) disappearance of the psychosis in most cases when the unoperated eye is uncapped; and (3) progressive reduction in incidence of psychoses with advances in operative technique, thereby shortening the period of covering both eyes. Further approximation to the multiple sensory interference of the isolation experiments is the observation of Axenfeld (1925) that cataract patients were more susceptible to postoperative psychoses if they also had impaired hearing. Since it is among the aged that most postoperative cataract psychoses occur, it is of more than passing interest that senile patients with nocturnal delirium had the delirium reproduced in the daytime when placed in darkened rooms or when their eyes were bandaged. Cameron[10] points out that these patients have a loss of retentive ability, so that visual images must be seen repeatedly for their identity to be maintained. The data from all these sources therefore strongly support the thesis that in the etiology of the postcataract extraction psychoses isolation with sensory (visual) deprivation plays an important role.

Another instance of sensory deprivation contributing to isolation pathology is seen in the paranoid psychoses of the hard of hearing. Here the literature is less extensive than in the cataract extractions and the evidence is not as conclusive. The literature includes clinical psychiatric impressions antedating Kraepelin's contribution,[11] indirect statistical studies,[12] and experimental studies.[13] Space does not permit discussion of the interesting psychological differences of visual as compared to auditory loss, particularly since the material is not germane to this thesis.

The mental disturbances reported by Mendelsohn and Foley[14] of patients with poliomyelitis confined to tank respirators present the clinical picture of "isolation psychoses." Other toxic or inflammatory processes appear to have been ruled out. Similar symptoms occurred in normal subjects confined to tank respirators. There are then at least three clinical disorders with special sensory limitations which seemingly parallel the isolation experiments.

Highly suggestive evidence of isolation as a stress, exclusive of special sensory restriction, are the psychoses of solitary confinement[1] and of language-isolated refugees.[3] Although the paranoid state is the usual type of psychosis attributed to isolation, I have now seen five cases of psychotic depression in women whose histories indicated long periods of relatively pronounced isolation preceding the onset of the mental symptoms. These depressions were devoid of paranoid trends. In seeming contradistinction is the report of Azima and Cramer (1956) that of five patients with psychotic depression who were subjected to isolation procedure (somewhat similar to that of Hebb) for three days, two experienced disappearance of the depression and three amelioration.

It has also been my clinical impression that patients with a single phobia which underwent a rapid and marked spread to many phobias, have families who permitted them a fair degree of isolation. The experience of Freud and others that active contravention is helpful in these cases supports the impression of the salutary influence of lack of isolation.

The possible relation of some senile psychoses to isolation certainly warrants investigation. The special vulnerability of the aged with visual and/or auditory impairment has already been noted. The adequate evaluation of isolation stress in older patients is made difficult by the fact that many such individuals are already close to mental decompensation. Acute stress of various types is often followed rather suddenly by a full-blown chronic brain syndrome in subjects not at all previously suspected of deterioration. There is need for a carefully controlled study contrasting the incidence and degree of prior isolation in matched groups of aged individuals with and without psychoses. I have such a study under way.

The evidence for interpersonal-isolation or seclusion per se as a stress factor in other medical illnesses also needs to be evaluated. Two physicians who were quite isolated during their hospitalization with coronary heart attacks developed depressions. Both were formerly out-going, active individuals and they themselves felt the isolation was a contributing factor to their depressions. The effects of relative isolation on patients confined to bed with casts, with paralyses, and with debilitating diseases call for evaluation. More study is needed to determine that additional contributory factors, such as latent predisposition to mental illness, toxicity, interference with cerebral circulation, or organic neurological involvement—peripheral or central—are not the significant etiological ones. The ready disappearance of recent mental symptoms on termination of the isolation (as occurs in typical solitary confinement prison psychoses) would favor seclusion as the significant causative factor.

Practical and Preventive Suggestions

Although there is need for more investigation before the degree and extent to which isolation constitutes a noxious factor in illness can be determined, several general therapeutic and preventive suggestions are warranted. Preference for two or more patients sharing a room, instead of private facilities; early ambulation for bed patients; activity programs in hospitals; frequent visitors; avoiding or minimizing hospitalization of the aged and very young (possibly substituting "rooming in" for both old and young); and plenty of light—at times, even during the night—might all be helpful in combating isolation tendencies. Some ophthalmological surgeons have preferred to extract cataracts in aged patients in the home to avoid removal from familiar surroundings. One might want to reevaluate the use of continuous tubs or the isolation of the old rest cures for the mentally ill.

On the preventive side, social participation and activity are well known as measures for avoiding or mitigating the harmful effects of seclusion. The isolating dangers of pregnancy and the infant rearing period, of occupational retirement, of the involutional period, and of old age and infirmity call for such intervention. The realistic hazards of isolation and sensory monotony have become a matter of public health concern for long distance night drivers of trucks on lonely roads, for monitors of radar screens, and for night sentinels, as well as the belt-line worker with repetitious, near-automatic activity. It behooves us therefore to be alert to the hazards of undue isolation with or without special sensory privation in many life situations.

Mechanism of Isolation Stress

The mechanism is unknown whereby isolations, with or without special alteration of sensory stimuli, produces symptoms. Since the experiments emphasize interference with normal sensory stimulation, it is not surprising that implication of the functions of the ascending reticular system (ARS) should be suspected. There is, however, no direct proof of the involvement of this neurophysiological system. Indirect data are suggestive. Sensory input mediated through the ARS has been shown to be important for the functions of attention (and concentration), arousal, wakefulness, and consciousness.[15] A number of the known symptoms of isolation stress occur in dysfunction of the ARS.

The electroencephalographic (EEG) tracings of subjects under isolation stress [16] resemble the EEG's of persons with hallucinations produced by psychosomimetic drugs [17] or clinical states of toxic deliria.[18] (The hallucinations in the isolation experiments have been said to be like those produced by mescaline and lysergic acid diethylamide [LSD-25].) The EEG findings consist of a decrease in the percentage of alpha waves and in the appearance of slow waves. However, decreased percentage of "alpha time" or total suppression of the alpha rhythm is not synonymous with altered function in the ARS, and might presumably be due to impairment of other functions.

Direct assay of impaired functions of the ARS, as evidenced in the EEG, is being made by me in instances of isolation stress and hallucinatory states. The finding of Blum (1957) that alpha blocking is impaired in patients with chronic brain syndrome and schizophrenia and not in normal controls is pertinent. Blum's study is being repeated to ascertain whether this finding can be correlated positively with the presence of hallucinations and/or paranoid delusions. For the time being, the evidence for involvement of the ARS is only suggestive.

Another hypothesis pertaining to the interference with sensory stimuli is that of Bartlett (1951). He postulates that illusions and hallucinations may arise from distorted peripheral sensory stimuli replacing the normal ones. A patient in whom he extracted a cataract (as in another case reported in the literature) had hallucinations in a blind area which Bartlett attributed to abnormal sensory stimuli from the altered peripheral optic structures. He further refers to reports in the literature on phantom limb which support his thesis. Amputees with phantom limbs will often lose the perception of the hallucinated limb while the nerve endings in the operated stump are being tapped. It is Bartlett's contention that the transmission of normal sensory stimuli from the periphery is necessary for accurate central (perceptual) interpretation. In patients with blind and anesthetic areas there are usually no hallucinations. Only when peripheral structures create abnormal sensory stimuli, such as optic scars or amputation neuromas, is there abnormal perception. The normal sensory stimuli from tapping the neuroma replace the abnormal stimuli and the hallucinated limb disappears. Hebb and his group also support the role of varied sensory input for normal mentation. Is it possible that in the isolation experiments there is loss in the normal variability of stimuli (or some other alteration), so that realistic interpretations are no longer made—that the "corrective" influence of normal stimuli is absent under these conditions? This hypothesis warrants further analysis and testing.

Even though the exact mechanisms of isolation stress are not known, measurability of that stress would be of great clinical value. Such knowledge would perhaps enable one to differentiate those patients who break under isolation stress from those who do not; to differentiate when isolation in any illness, or a certain special illness, plays a significant etiological role. With this end in mind, my current research includes the measuring of plasma 17-hydroxycorticosterone (compound F) and catecholamines before, during, and after the height of the stress. If the stress can be measured, solution of both experimental and clinical problems of isolation should make much more rapid progress.

Conclusions

Paranoid states in persons subjected to solitary confinement, in the hard of hearing, and in language-deprived refugees are clinical reference to the harmful effects of isolation, known to psychiatrists for a long time. The history of the psychotic complications of cataract surgery reveals the great similarity, both as to origin and as to type, between these mental disturbances and those noted in recent experimental "sensory deprivation." Other medical and surgical illnesses should be reviewed for possible harmful effects of isolation, particularly among the aged.

Improvements in medical care and prophylactic measures based on avoidance of isolation stress can be recommended even now. The isolation stress may be due to interference with mediation of sensory functions via the ascending reticular system. The evidence is still inconclusive. Electroencephalographic studies are under way to investigate this point. Measurement of isolation stress would promote objectivity in the clinical and experimental studies. Perhaps the determination of the level of plasma 17-hydroxycorticosteroids and the catecholamines will serve this purpose.

2007 Wilshire Blvd. (57).

References

1. Nitsche, P., and Wilmanns, K.: History of Prison Psychoses, Nervous and Mental Disease Monograph 13, New York, Nervous and Mental Disease Publishing Company, 1912.

2. Braun, E.: Psychogene Reaktionen (Isolierung und Induktion), in Bumke, O., Handbuch der Geisteskrankheiten, Berlin, Springer-Verlag, 1930, vol. 5, pp. 208-217.

3. Allers, R.: Ueber psychogene Störungen in sprachfremder umgebung, Ztschr. f. d. ges. Neurol. & Psychiat. **60**:281-289, 1920.

4. Davis, K.: Final Note on Case of Extreme Isolation, Am. J. Sociol. **52**:432-437, 1946-1947.

5. Heron, W.; Bexton, W. H.; and Hebb, D. O.: Cognitive Effects of Decreased Variation to Sensory Environment, Am. Psychol. **8**:366 (Aug.) 1953.

6. Lilly, J. C.: Mental Effects of Reduction of Ordinary Levels of Physical Stimuli on Intact, Healthy Persons, Psychiat. Res. Rep. **5**:1-9 (June) 1956.

7. Solomon, P.; Leiderman, P. H.; Mendelson, J.; and Wexler, D.: Sensory Deprivation: Review, Am. J. Psychiat. **114**:357-363 (Oct.) 1957.

8. Von Frankl-Hochwart, L.: Über Psychosen nach Augenoperationen, Jahrb. f. Psychiat. **9**:152-182, 1890.

9. Beigelman, M.: Personal communication to the author.

10. Cameron, D. E.: Studies in Senile Nocturnal Delirium, Psychiatric Quart. **15**:47-53 (Jan.) 1941.

11. Kraepelin, E., cited by Ast, F.: Die Behandlung schwer erregter Geisteskranker, Allg. Ztschr. f. Psychiat. **86**:138-155, 1927.

12. Houston, F., and Royse, A. B.: Relationship Between Deafness and Psychotic Illness, J. Ment. Sc. **100**:990-993 (Oct.) 1954.

13. Hebb, D. O.; Heath, E. S.; and Stuart, E. A.: Experimental Deafness, Canad. J. Psychol. **8**:152-156 (Sept.) 1954.

14. Mendelsohn, J. H., and Foley, J. M.: Abnormality of Mental Function Affecting Patients with Poliomyelitis in Tank-type Respirator, Tr. Am. Neurol. A. **81**:134-138, 1956.

15. Moruzzi, G., and Magoun, H. W.: Brain Stem Reticular Formation and Activation of EEG, Electroencephalog. & Clin. Neurophysiol. **1**:455-473 (Nov.) 1949.

16. Heron, W.; Doane, B. K.; and Scott, T. H.: Visual Disturbances After Prolonged Perceptual Isolation, Canad. J. Psychol. **10**:13-18 (March) 1956.

17. Chweitzer, A.; Geblewicz, E.; and Liberson, W.: Action de la mescaline sur les ondes α (rhythme de Berger) chez l'homme, Compt. rend. Soc. de biol. **124**:1296-1299 (April) 1937.

18. Romano, J., and Engle, G. L.: Delirium: Electroencephalographic Data, Arch. Neurol. & Psychiat. **51**:356-377 (April) 1944.

DESIRABLE ATHLETICS FOR CHILDREN

George Maksim, M.D., Washington, D. C.

A program of athletics for children should be such as to contribute to their total fitness, which embraces physical, mental, emotional, moral, social, and spiritual values. Such a program should enlist children not as spectators but as participants and should therefore be adapted to the developmental level of the children. It should be diversified rather than one-sided and should not involve the physical risks of such sports as boxing and tackle football. It should be confined to the local community, and the participation of children in national competition is to be deprecated. A program that is backed by a group of informed and mature adults, is planned with the best interests of the children in mind, and gives opportunities to the slow learners and the handicapped deserves to be encouraged and helped by the physicians of the community.

"What are desirable athletics for children?" This is a question that can be quite properly raised in this era of discussion pertaining to fitness of American youth. Some of the leaders in discussions in this area would purport that their ideas of a suitable program of athletics will produce optimal fitness of youth. It would be well here to pause and consider what is meant by youth fitness and what part athletics should play in its promotion.

Fitness for Living

We are really seeking the total fitness not only of the young but of all individuals. This has always been a goal of members of the medical profession. It is particularly true among those of the profession who supervise the growth and development of infants and children. The term "fitness" has been variously defined, but essentially it should mean the total well-being of each individual during his formative years and in adult life. It does not mean simply the absence of illness or the existence of superior muscle strength or agility.

An interest in fitness, however the term may be defined, is not new to American physicians. It has been of concern to members of the American Medical Association since its organization in 1847. Public health physicians also have had an avid interest in, and concern for, health protection and, therefore,

---

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

the development of fitness ever since local governments assumed any responsibility for public health.

We Americans have always had an understandable pride in our physical and moral strength. Generations have gloried in the courage and hardihood of the early settlers, the endurance of the pioneers who broke the wilderness, the capacity of young men to survive in the wars, the ability of our people to adjust to the stresses of a complex civilization.

The question now is, "Are we fit to cope with the tasks of our time?" Today, America finds itself in a complex world situation that is uncertain in the demands made on the physical, mental, moral, and spiritual resources of the people. It is a period when our nation must be strong. It is a time when all of us—physicians, teachers, and all citizens—have increased obligations and opportunities with respect to fitness for living.

It would be well here to make some further comment about the definition of fitness. As I implied earlier, some think that fitness is related solely to measurement of strength and flexibility of certain muscles. The following story was presented on the radio some months ago:

> They say Africa is a continent of strange contrasts. And Mal Whitfield, America's two-time Olympic 800-meter champ certainly agrees. He learned first hand on a recent State Department goodwill tour. Whitfield was supposed to show a group of natives something about physical training. Mal did a push-up and then asked his group to do likewise. One native after another tried but no one succeeded. Exasperated, Mal tried a different exercise. Just then one of the natives leaped over a fence and disappeared. Whitfield was bug-eyed. The fence was a shade over seven feet high. Then another native raced past him and into the forest. "Where's he going?" Whitfield inquired. "To catch an antelope," was the answer. Mal shook his head and walked away muttering to himself, "And they couldn't do a push-up."

These, and many other illustrations might well pose the question, "Fitness for what?"

We should always continue to think of the total fitness of the total child, and, may I repeat, a true concept of fitness embraces physical, mental, emotional, moral, social, and spiritual values. It includes every child, the handicapped and his rehabilitation, as well as those who are "whole."

Desirable athletics for children may make their contribution to the total fitness of the child, the youth, and the adult in several ways. Before we proceed to more detailed discussion I would like to clarify two points. First, we are discussing children 12 years of age and under (those in the pre-teen-age group), and, second, nothing which is said here must be construed as indicating denial of competition to the growing child. This cannot be done, since competition is an inherent characteristic of the growing individual. He competes with himself or others in his environment. Competition is part of our American way of life.

Characteristics of Sports Programs

There are certain characteristics about athletic or sports programs for the age group to which we refer that should be kept in mind. In fact, certain features should be emphasized and reemphasized.

Sex.—In the preadolescent group, both boys and girls should be considered equally. Girls in this early age should not be mere spectators but should be participants. Members of both sexes should have an introduction to athletics even at the pre-school-age level—in the home or the nursery school environment. It is at this level that mastery of the coarser movements of the body should be attempted without any emphasis on winning or success. The effort should well be in the direction of improvement over past performance.

Developmental Level.—All athletic activities should be geared to the developmental level of each child and not to his weight or chronological age. Children in this immature, growing, developing stage have varying rates of gradual, or more rapid, change from the clumsy, coarse, gross movements to the more refined, coordinated, and accurate movements of skill. Running, catching, throwing, and other physical activities in athletics, sports, and games are at first quite awkward and inaccurate, but in the years to come the child may develop into a gracefulness and achievement that could not be anticipated.

Diversity of Opportunity.—All athletic and sports activities of the elementary school child should be so arranged that there is an opportunity to participate in many activities throughout the year, within and without the school program. These activities should range from ordinary calisthenics through the various sports programs in a well-regulated physical education department in the schools. These activities should be mandatory within the degree of ability of each individual child. The amount of physical exercise outside of the program is often unpredictable. Undue concentration on any one sport at this age level has rarely developed a "star." On the other hand, a program in which a diversity of opportunity is available has, on many occasions, demonstrated, as maturation occurred, latent ability in athletics that neither the parents nor other adults had suspected were present.

Perhaps it would be well if more children in this age group could follow the philosophy expressed by "'Where Did You Go?'—'Out.' 'What Did You Do?'—'Nothing'"—a recent popular book by Robert Paul Smith. Children in this age range should not be pressured into receiving adult acceptance by conforming to a rigid, highly organized, and highly competitive program in any of the sports. All sports programs should give all children an opportunity to participate, especially those with seemingly less natural aptitude. The natural athlete will emerge despite any programs.

Any program in any sport for the younger child should be confined to the local community. It is highly questionable whether state or national tournaments, or any large-scale exhibition programs, promote the maturation of a child into a youth with total fitness. The recent report by the School Health Committee of the American Academy of Pediatrics on the subject of competitive athletics recommends that contact sports, such as tackle football and boxing, not be considered as desirable athletic activities. The former has risks, and the latter also has risks and an undesirable philosophy.

I would like to take opportunity at this time to commend the program of Long Beach, Calif. This, as reported, seems to eliminate the undesirable adult pressures of programs in various sports, particularly baseball.

It has recently been reported that this year's Little League Baseball program has changed from a national to an international one, with many countries participating. Certainly, we are all currently aware that there is a great need for more international relationships, but is this the level at which it should be attempted, with a small, select, minority group of early matured children competing? Again, all youngsters, not just the natural athletes, should have opportunities for participation. Furthermore, this participation should be for the benefit of the child and should not be used as an attempt to bind faltering family relationships.

Program Planning and Supervision for Optimal Growth and Development

All athletic programs in the prepubescent age range should be planned in the best interest of optimal growth and development—physical and emotional. They should be fun and part of the joy of living and serve as a wholesome outlet for the normal energy and exuberance of the young, as well as a constructive and beneficial learning experience. Overemphasis on any one activity may produce in the boy or girl a situation where the borderline between healthy fatigue and harmful exhaustion is trespassed. The failure to win graciously or to lose stoically may be equally harmful in the emotional growth and development of a child. The picture of a boy crying after some athletic contest might be excused by some with the comments that "it did him some good to cry." However, the first question that comes to mind is "did he need to cry at all" over a childhood athletic contest which is only a stepping stone to other and more important contests?

This optimal physical and emotional growth and development should be the primary concern of all adults—parents, physicians, teachers, and recreation leaders in programs of desirable athletics for children 12 years of age and under. It is at this level that the first steps are taken toward a development of total fitness in youth to result in a happy, well-integrated adult.

Conclusions

Certain salient features for a program of desirable athletics for children may be enumerated. First, a desirable program is one which is enthusiastically accepted by the community, one which is worked out through the combined efforts of all concerned—the parents, teachers, recreation leaders, and the physicians in the community who can act as advisors. It should not include contact sports.

Second, the health aspects should be clearly set forth. Every child should have, in addition to his annual physical examination, a complete medical examination before participating to any degree in a formalized program of athletics. An injured or ill child should have the approval of his physician before rejoining the athletic program.

Third, there should be an informed, emotionally stable group of adults behind every program of athletics. Parent-teacher associations and other civic leaders can exert an influence in this direction which will provide for the better utilization of existing facilities, as well as provision for necessary facilities where they do not exist. Gymnasiums should not be changed to science classrooms and laboratories—we need both.

Fourth, all desirable physical education and athletic programs should be for all children and suited to their developmental levels, and they should make provision not only for the talented but for the slow learners and the handicapped.

Finally, it is not only the physician's concern but his responsibility to exert his influence and assist in the development of programs of desirable athletics which will have as their primary interest the total well-being of the total child and the prevention of potential inadequacies when that child reaches adult life.

1418 Goodhope Rd. S. E.

THE OLDEST LIFE INSURANCE COMPANY.—The first life insurance company, "The Corporation for Relief of Poor and Distressed Presbyterian Ministers and of the Poor and Distressed Widows and Children of Presbyterian Ministers," was established [in 1759] in Philadelphia by the Synod of the Presbyterian Church. This company, now Presbyterian Ministers' Fund, is the oldest life insurance company in continued existence in the world.—Life Insurance Fact Book, Institute of Life Insurance, New York, 1957.

EDUCATIONAL ASPECTS OF ATHLETICS FOR CHILDREN

Fred V. Hein, Ph.D., Chicago

A program of athletics is important in the education of young children, and competition is a vital part of the experience. But competition is excessive if it results in emotional stress beyond the capacities of a child, entails undue risk of permanent physical deformity, or diverts so much of the school's equipment, attention, and time to a few physically gifted children as to deprive many others of opportunity for participation. The ideal athletic program provides opportunities for all boys and girls; it should be diversified and graded. It should be planned in a way that will not permit exploitation of children by adults for selfish or commercial reasons, and the motivations provided by occasional interscholastic events should be used to bring the benefits of active sports participation to the greatest possible number of children.

Few problems have been subject to as much misquotation, distortion, and misinterpretation as the issue of athletics for children and youth. So before getting to the basic problem it may be helpful to clear away a number of side issues that have frequently caused trouble in such discussions.

Educators, like the medical profession, are divided on some of the issues involved. But there is a body of reference such as the views expressed by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. Pertinent recommendations, reflecting the combined views of educators and physicians, are also available in the reports of the National Conferences on Physicians and Schools, sponsored by the American Medical Association.

Such groups have strongly favored competitive sports for children and youth at suitable age periods, of appropriate kinds and under proper supervision. In fact, they suggest more competition in more sports, with more teams, and more individual activities for more children of both sexes. However, the word controlled should be emphasized. One may wish to control competition in terms of the maturity of the competitors, but this can in no way be interpreted as being against competition. A common misrepresentation is to label anyone who proposes athletic controls as being opposed to competitive sports. On the contrary, those who advocate such regulation do so in the best interests of athletics. It is only through proper regulation that sports can provide their optimum benefits for children and youth.

Not every aspect of education can be predicated on objective evidence. Experience must have its due and there is still a place for reason, logic, and interpolation in human affairs. In developing our programs of sports for children and youth, we should certainly utilize every bit of objective evidence that is available to us. But in the absence of such evidence and for problems that do not lend themselves to objective research, we must rely on reason and common sense.

Definitions

One of our problems in discussing what is desirable in a sports program for children and youth is definition of terms. For purposes of this discussion, we are concerned primarily with children of upper elementary and lower junior high school age. As a general rule these youngsters will be under 13 years of age and in grades below the ninth. Athletics and sports are used synonymously to include individual, low organized and team games, and also tumbling, rhythms, and conditioning activities. Competition is used broadly to cover competition against one's own past record, against other individuals, and as a member of a team against another group.

The terms "high-pressure program" and varsity-type program are used to indicate an athletic program for young children which simulates that of the colleges or professional sports. These terms refer to programs for young children which include championship schedules, long-distance travel, all-star teams, tournaments, bowl games, and the like. They also refer to any type of athletic program which is developed in terms of adult satisfaction rather than the needs of children and youth.

Competition and Cooperation

This brings us to the matter of cooperation in relation to competition. We need to look carefully at these two terms. They are not, as some people would have it, in conflict with each other. Competition is a part of our way of life, a valued American heritage. To it we attribute much of our progress in science and industry, our superior standard of living. Cooperation also is an essential factor in human affairs. Many of our endeavors depend for

---

From the Bureau of Health Education, American Medical Association.

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

their success on the quality of cooperation achieved. A happy mixture of the two, competition and cooperation, makes for effective living in a democracy.

The ability to compete ethically and to cooperate effectively must be learned; no one is born with these skills. Athletics furnish one medium for such learnings—both competitive and cooperative. The player must do his part as an individual competitor but must also cooperate with other members of the team. Athletics then require a mingling of competitive and cooperative effort analogous to real life. Because they are so absorbing to youth they have their own self-contained motivation. This makes properly developed athletics particularly potent as a means of education for both competition and cooperation.

Our discussion here is confined to the former but not with the question of competition versus no competition. Competing is an inherent part of living and learning. To even suggest its elimination is ridiculous. So our problem is to decide on the desirable intensity of competition for the younger age group and to outline the kind of athletic program that will permit us to maintain this desirable intensity. In attempting to do this we must look at both health and education factors. Educators rightly turn to physicians and physiologists for guidance relating to the health aspects of athletics. But queries concerning the effects of varsity-type athletic competition on young children bring varied answers:

Rowe[1] and Fait[2] conclude from studies that young participants in interscholastic sports do not grow as well as those having a well-organized physical education program. McCraw[3] reporting the results of another study indicates that those taking part in interscholastic sports show a greater rate of growth and physical development.

Lowman[4] surveyed his orthopedic colleagues and found the great majority opposed to "varsity-type" interscholastic competition below the ninth grade. Fait[2] a few years later, with the question worded somewhat differently, reported that a majority of orthopedists responding made the opposite kind of response.

Promoters of midget football leagues point to their records of relatively few apparent injuries as proof that the sport is as safe for youngsters as for their older brethren. But studies of injuries at the high school level[5] show that the younger and greener a youth the more likely he is to injury. That all serious injuries are not apparent was demonstrated when x-ray studies of so-called insignificant injuries revealed 14 fractures.[6]

Similarly, it has been indicated that susceptibility to epiphysial injury in the young athlete is not sufficient to contraindicate high pressure competition in contact sports.[2] However, Hibberts' analysis of football injuries[5] shows that one out of five participants will sustain an injury. Of these injuries one out of five will be a fractured bone. Other reports[7] suggest that in fractures of the growth areas of long bones in youngsters about one out of eight will give trouble with possible deformity in spite of the best of medical care. It has also been pointed out that the hazards in this connection are greatest in contact sports such as football.

Another facet of the injury problem is related to what Lowman[4] labels "wear and tear" on the immature organism. He suggests that acute trauma may be less important than continuing minute trauma to the growing skeleton. Early arthritic changes, low back and sciatic symptoms, and other similar problems, he feels, can frequently be attributed to the cumulative effects of such minute trauma. The counter argument is, however, that those youngsters able to make the high-powered teams are more mature physiologically than their fellows[8] and consequently can stand up under the stresses of sports without such harm. And so the controversy continues.

"But what about the effects on emotional health?" the educator asks. There have been attempts to get at this experimentally: In one study employing a galvanometer-type instrument,[9] reactions of boys to their ordinary physical education activities were found to be as pronounced as those evidenced in connection with varsity-type contests. On the other hand, in another study comparing simulated pressure situations in sports with those in which pressure factors were not introduced[10] reactions of participants differed markedly. As high as 30% experienced nausea in the pressure situation while only one boy was so affected among all the participants under nonpressure conditions.

In a survey of parental opinion about sleep and sports a large majority of parents said that the participation of their youngsters in varsity-type games did not interfere with sleep.[9] On the other hand, Giddings[11] in sleep studies using standard levels of motility, as a measure of soundness of sleep, found that, in young players, highly competitive sports measurably interfered with the depth and nature of sleep.

Certain objective evidence probably relating to emotions and injuries is indirectly available. Athletic injury statistics show four or five times as many serious injuries in games as in practice periods[5]—this in spite of the fact that the time spent in practice ordinarily averages a great deal longer. The higher proportion of injuries in the highly organized situation can probably be traced to accompanying tensions and pressures. Therefore, the implication is that the high pressure conditions will create a far greater injury hazard. But those who do not agree say that these statistics are from studies of older age groups—high school and college. "How do you know they will apply for the younger, more plastic children?" they ask.

Also, on the emotional side psychiatrists and psychologists have been polled as to their feeling about the effect of high pressure sports on young children. There was general agreement that high pressure elements are detrimental at this age level.[12] But they point out that such elements are not part of the athletics themselves but of the conditions surrounding them. These, the mental health experts say, should be eliminated or controlled. This is easier said than done, however, and they offer no specific formula for such control.

There is no lack of agreement among physicians or among educators concerning the need for medical controls in sports for youngsters. Everyone recognizes the need for a medical examination prior to the season of participation, for a physician being in attendance at contests in strenuous or body-contact sports, for medical determination of ability to return to play following an injury, and other such controls. It is only on the question of the desirable intensity of the competition that disagreement exists.

Educational Considerations

Where does this lack of agreement on the effects, physical and emotional, of high pressure programs leave us? It implies that the decision as to the intensity of athletics for children must be predicated largely on educational considerations. Let us examine some of these factors that need to be evaluated:

Growth Factors.—Child growth and development specialists point out that the chief business of the growing child is to grow. Growth is a highly demanding energy-consuming process with which nothing must be allowed to interfere.[13] Rational activity will assist growth, but unreasonable stress, emotional or physical, can have the opposite effect. The child may be pushed into a fatigue cycle [14]—fatigue, impaired nutrition, impaired general health, decreased ability to rest, greater fatigue—again around the cycle.

Learning and Emotions.—Psychiatrists and psychologists agree that growth toward mental-emotional maturity and stability must be a gradual process. We do not teach children to swim emotionally by throwing them into an emotional stream beyond their depth.[15] On the other hand, we do not help them to learn how to handle their emotions by removing the problems and situations that generate emotions. For the growing child, the emotional hurdles must be neither too high nor too low; they must be consistent with mental-emotional maturity. It is the eventual task of educational leadership to evolve a graduated curriculum for emotional growth based on such principles.

Education in Values.—Football fever or hoop hysteria need not be serious diseases. Within reasonable limits they are probably good for school, community, and even national morale. Certainly they are a part of today's culture. But for most people these are transient things, held somewhat apart from the workaday world. When they become one's only world, trouble is ahead. In today's society it is easy for the athlete to feel that sports make the world go around, or at least make education go around. This is a snare and delusion except for a relative handful who will earn their living as professional athletes. For the rest such a false set of values is completely unrealistic. It is the task of education to develop its athletic programs so as to place sports in their proper perspective in total living.

Motivation of Sponsors.—Adult volunteers who give their services unselfishly to children deserve our highest commendation. The great majority who urge or promote high-powered sports for children are honest in their convictions. They feel strongly that such promotions are good for boys and girls. The same can be said for a great many parents. But child psychiatrists suggest that the motives of such parents and volunteers be examined and reexamined to be certain they are what they seem,[16] and that they stay that way. Do the inner motives jibe with those that show on the surface? Is there a desire to relive athletic successes in the child? Or conversely is there a wish to make up for youthful athletic frustrations? Does the role of coach or manager have an inordinate appeal in relation to the concern for children? These are only a few of the questions that need to be asked.

Social Learnings.—We claim certain social values for athletics; educators would be the last to deny these. Sports, properly guided, can help to build qualities like loyalty, courage, and over-all good sportsmanship. They can contribute to the development of leadership ability. They can teach the importance of both individual effort and team play. But all of these values and some others can be realized for children right in their own schools and communities without high-powered tournaments, bowl games, and the like. To claim any special social values for an athletic trip across the state or nation is simply not facing facts. These same values could be gained from a band tournament, outing activities, an educational excursion, or simply a trip with family or friends.

Educational Exploration.—Most of us would probably agree that interests are founded largely on experience. Children learn to know and enjoy a variety of sports only by participation in them. If they are to develop broad interests there should be opportunity for wide athletic exploration during the upper elementary and early junior high school years. By introducing high pressure, varsity-type programs at this most impressionable age, we tend to crowd out other activities, and encourage early specialization. Thus we deprive children of many other sports experiences as well as the opportunity for participation in a variety of other developmental activities. Also, by centering attention on the so-called major sports, to the exclusion of others, we sow the seeds for "spectatoritis" in later life. Few people participate in the major sports past age 25. And few people who have not learned to enjoy the minor sports in childhood will be converted to the active life in adulthood.

Learning Skills.—Experience indicates that children can learn sports skills much earlier than has commonly been thought. Interestingly enough, however, the earlier they are learned the sooner interest seems to drop off in the average individual. With the exception of the star performer, there seems to be a fairly constant interest-span for participation in a given sport. Educationally, then, the problem becomes one of determining when children are ready for best learning in a given activity and over what period the experiences provided will be of greatest value to them.

No one should or could justify a sports program for young children designed solely as a "farm-system" for high school and college teams. But there is nothing wrong with the concomitant development of good performers through a program designed for children as they are. Harry Combes, coach of the University of Illinois basketball team, writing with Clyde Knapp [17] contends that an extensive program for all is better training for over-all future athletic success than intensive competition for a few. The early maturers who receive all the attention in the intensive program may not be the best prospects in high school and college years. Meanwhile those who mature later and might end up as superior performers lose interest because of lack of opportunity.

Physical Unfitness.—In many areas of education, the gifted child has been neglected. But in physical education including athletics this is certainly not the case. The physically gifted child has usually had the cream of facilities, equipment, and time and attention from personnel. Frequently, this has meant that there has been little or no sports program for other children. At the elementary school level, as a general rule, facilities and personnel are too limited to support both programs. With our crowded schools these conditions are not likely to improve in the near future. Thus, those who are mostly physically fit are likely to receive the major share of attention. Such a program can help to perpetuate physical unfitness among the many children so deprived of opportunity for participation.

What Kind of Program?

Athletic competition needs to be as carefully graded as other parts of the school program. In the early school years (grades 1-3), young children find enough and suitable competition in informal play and their class activities in physical education. As the child grows older (grades 4-6) a desire for further competitive activity shows itself. Boys and girls begin to enter the team game stage and as time goes on will turn more and more to this type of play. An athletic program which includes only a few children of only one sex cannot satisfy this need. What type of program should we recommend? [18]

First, a broad program of class instruction in physical education for all boys and girls is needed. Opportunities to learn skills in a wide variety of games and other activities should be emphasized. This requires definite teaching and not merely the throwing out of balls for unsupervised play.

Second, a varied program of informal play opportunities and intramural sports should be offered for boys and girls in the upper elementary and early junior high school years. In such activities competition is confined to games and contests between teams within an individual school.

Third, occasional invitational games, sports days, and play days involving two or more schools may be arranged. Such activities are limited to neighboring schools or to a small geographical area. The emphasis is on informality without high pressure elements such as championships, tournaments, all-star contests, and the like.

A three-point program like the above makes the best possible distribution of available funds and facilities among all children. It provides satisfying activities for girls as well as boys, for the child with average skills, for the physically gifted, and even for youngsters with handicaps. Such a program spreads the benefits which competitive sports hold for children to all those who wish to take part. It permits the curriculum in competition to grow and develop a pace consistent with the maturity of the child.

Problem Practices

Immature boys and girls are not little men and women; they need a program specifically tailored to their needs. Yet bowl games, all star events, and other activities that tend to force patterns of sports designed for college and professional athletes down into the elementary schools are being pushed in some places. This has led a variety of professional groups interested in the health and welfare of young children to recommend against the following types of procedures and programs: (1) tournaments, frequent contests, long seasons, bowl games, or other procedures that may cause undue pressure or make excessive demands on young boys and girls; (2) games and contests played at night or other times outside usual school or recreational hours; (3) travel beyond the immediate neighborhood or in the case of smaller rural schools to nearby communities; (4) "grooming" of players for high school teams or attempts to make elementary school sports a "farm system" rather than a program for the children themselves; (5) commercial promotions which under various guises seek to exploit youth for selfish purposes; (6) programs which usurp a disproportionate amount of facilities, funds, and staff time for a selected few rather than for all children; and (7) overemphasis through tournaments, bowl games, "all-star" teams, and other emulations of adult athletics.

Summary

Under good leadership athletics can help to teach moral and spiritual values—to mold character. They can provide wholesome recreation, for both the present and the future. They can help to build organic vigor and improve strength, agility, and endurance. But these values are not an automatic outcome of athletics. They will not accrue unless the sports program is developed with consideration for the physical, mental-emotional, social, and educational principles involved. They cannot be achieved if the sports program includes only a few children and a limited number of activities.

This calls for a reemphasis rather than a deemphasis of athletics. It demands an athletic program that is available to each child attending school so that no boy or girl is denied an opportunity to gain the values of sports participation. Second, it requires medical supervision to make certain that the program will be conducive to the health and safety of each child who participates. Third, it necessitates planned interpretation of that program to the community—to build public understanding of the real purposes and values of athletics in education.

535 N. Dearborn St. (10).

References

1. Rowe, F. A.: Growth Comparisons of Athletes and Non-athletes, Res. Quart. **4**:108-116 (Oct.) 1933.

2. Fait, H.: Analytical Study of Effects of Competitive Athletics upon Junior High School Boys, Thesis, University of Iowa, 1951.

3. McCraw, L. W.: Comparison of Physical Growth and Development of Athletes and Non-athletes at Junior High School Level. University of Texas.

4. Lowman, C. L.: Vulnerable Age, J. Health & Phys. Educ. **18**:635-636 (Nov.) 1947; Relations of Postural States to Competitive Sports, Phys. Educ. vol. 9, Oct., 1953.

5. Hibbert, R. W., Jr.: High School Football Injuries, Rocky Mountain M. J. **47**:276-278 (April) 1950. Joint High School Football Injury Study: Michigan, Minnesota, and Wisconsin, Wisconsin State High School Athletic Association, Marinette, Wis., 1949.

6. Foster, W. K., and Wells, J. C.: Unrecognized Fractures in High School Athletes, Minnesota Med. **31**:1206-1210 (Nov.) 1948.

7. Eichenlaub, J. E.: Injuries to Growing Bones, Today's Health **32**:28-29, 64-65 (May) 1954. Crowe, H. E.: Orthopedic Facts About Football, J. School Health **17**:180 (Sept.) 1947.

8. Hale, C. J.: Physiological Maturity of Little League Baseball Players, Res. Quart. **27**:276-284 (Oct.) 1956.

9. Skubic, E.: Experimental Investigation of Emotional Responses of Boys to Little League and Middle League Competitive Baseball, Res. Quart. **26**:342-351 (Oct.) 1955; Studies of Little League and Middle League Baseball, Res. Quart. **27**:97-110 (March) 1956.

10. Johnson, B. L.: Influence of Pubertal Development on Responses to Motivated Exercise, Res. Quart. **27**:182-193 (May) 1956.

11. Giddings, G. A., cited in Sleep and Children, a report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, 1956.

12. Desirable Athletic Competition for Children, Report of the Joint Committee on Athletic Competition for Children of Elementary and Junior High School Age, Washington. D. C., American Association for Health, Physical Education, and Recreation, 1952.

13. Krogman, W. M.: Child Growth and Football, J. Health & Phys. Educ. **26**:77-79 (Sept.) 1955.

14. Parmalee, A. H.: Fatigue in Relation to Growth and Development, J. Health Educ., vol. 16, Feb., 1953.

15. Reichert, J. L.: Competitive Athletics for Pre-Teen-Age Children: Challenge to Physicians, J. A. M. A. **166**:1701-1707 (April 5) 1958.

16. Report of the Fifth National Conference on Physicians and Schools, A. M. A. Bureau of Health Education, 1955.

17. Knapp, C., and Combes, H.: Elementary Interscholastic Basketball: Does This Produce Superior High School Players? J. Health & Phys. Educ. **24**:12-13 (Nov.) 1953.

18. Report of the National Conference on Physical Education for Children of Elementary School Age, Athletic Institute, Chicago, Jan., 1951.

SPACE FLIGHT.—Scientists and engineers backed by the U. S. Government are headed for outer space. The cost of this campaign will be as astronomical as its objective, but the men who lead it consider its success a national necessity. They point out that the earth's atmosphere is an insignificant film, thinner in proportion than the skin of an apple, and that military technology is about to outgrow it, as it outgrew the earth's surface two world wars ago. Navigation of the air film is no longer enough. No nation will be safe unless it can also navigate the vacuum that hangs overhead. The new status of space flight, formerly made suspect by visionaries and fiction writers, was not defined in public until we recently held our Astronautics Symposium at San Diego. Planned as a small "confab" of space-minded missile men, this conference ballooned into a crammed mass meeting of engineers and scientists representing airplane, electronic, and instrument companies, as well as universities and all three armed services. A few years ago most of these hardheaded men would not have attended a space-flight meeting except incognito. Now we are eager.—Capt. W. M. Snowden, M. C., U. S. N., Newer Concepts in Aviation Medicine, *A. M. A. Archives of Industrial Health*, September, 1958.

COMPETITIVE ATHLETICS FOR CHILDREN

Jean Hoxie, Hamtramck, Mich.

We all agree that the three things a growing child needs most are food, sleep, and exercise. Parents stress the first two and overlook the last. Allowing the matter of exercise to take its own course is not too bad, since the child's interest to use his body is so strong. But a young one does need guidance in the amount and kind of exercise he takes and a constant check on his inclination to overtax himself.

The "Golden Rule"

We will assume that every competent, successful coach is familiar with and able to impart the basic fundamentals of his or her effort, so let us pass on to some of the things common to all sports. One of the things I, myself, consider more important than whether Johnnie can break 70 in golf, win tennis matches 6-0, or even be a star in touch football or track, is sportsmanship. Sportsmanship is, after all, only an application of the "golden rule."

One of our authorities on child development said, "All young children are poor sports; an average child takes about 15 years to develop to the point where he can conform to adult standards of good sportsmanship. When children are poor sports they do not have warped personalities; they are not potential criminals; they are just downright spoiled; they are children behaving like children."

A child who is a poor sport can hardly grow up to be a good citizen. Let's face it: good sportsmanship begins at home. If mother pouts at the bridge table or father burns after a missed putt, children think it is accepted behavior.

Children, whether players or spectators, also take their cues from their coaches. An undignified, ill-tempered coach who curses, boos, jumps up and down, protestingly storms out onto the floor, or throws up his hands after losing a game or point is hardly setting an admirable example. A wiser coach or parent recognizes achievement and applauds good play of both teams.

Give your children time to develop. When they make a mistake, talk it over with them. Encourage them to play with their contemporaries. Children learn sportsmanship from playing with other children. You will be surprised just how much they learn and how fast. It is better when they are all about the same age and size; then, no one child can dominate the others. Everyone faces the fact of winning and losing.

Competition in athletics for children can serve as a positive force if every child learns to take losses as well as victories. Competition among children should not follow the intercollegiate pattern of worshiping the star performer and neglecting the unskilled. It should, instead, be kept within such bounds as to promote both the growth of the child's body and the development of a personality.

Success and Failure

Another thing we must consider is failure. Don't be too quick to decide that some child has failed to learn some particular physical skill. Give him plenty of time and some extra coaching on the side. Never ridicule his awkward early efforts. Usually failure to master some desirable skill, such as being able to catch a ball, hit a drive, or make a short putt, is caused by a lack of opportunity to practice or by self-consciousness.

Too much striving? Don't let the child push himself past his own capabilities. Keep him competing with those of his own age level. Do not let the child become overtired. This fatigue could be caused by inadequate food, lack of sleep, overexercise, emotional frustration, or all four together.

We cannot have a successful sports program without competition—but perhaps not the kind of competition we have on the intercollegiate pattern of men's sports, with its ballyhoo, its insane and inane worship of star performers, its attention to the skilled and neglect of the unskilled, and its sporting followers who demand victory at all costs.

The prime objective for any person, child or adult, is mastery of the game within the limits of his capabilities. In addition, the tremendous sense of achievement that comes from doing something well may be an aid to successful personality development in the child. The habits of diligence and perseverance necessary to achieve mastery and also to retain mastery of a sport should serve the child both in the athletic situation and also in other situations which the child might meet.

Competition, if not viewed as the prime goal but rather as an additional goal, may serve in a positive manner. It is not desirable to let the child stay in an "ivory tower," where his supremacy is never threatened. On the other hand, great care must be exercised that the child is not put in a situation where defeat is inevitable and to which he can react only with despair and withdrawal. Where a child has a reasonable chance for victory and when

---

Director of Tennis, Hamtramck Public Schools.

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

he is aware that mastery of the game is his prime goal, competitive athletics then serve as a positive force, for every child must learn to take losses as well as victories.

In the last analysis, it is the coach who senses his pupil's needs and limits, who is able to make competitive athletics a positive force for growth and personality development in his students.

IMPLICATIONS OF LONGITUDINAL RESEARCH IN FITNESS PROGRAMS

Robert W. McCammon, M.D.
and
Alan W. Sexton, Ph.D., Denver

Fitness at best is a vague concept which can only be defined in terms of the purpose for which the individual desires to be fit. Fitness at a given moment may fail to reflect or predict fitness as briefly as six months from the testing. Fitness at the time of testing may vary remarkably, dependent on the standard of measurement used. The response to conditioning programs, such as athletic participation, is a highly individual thing rather than a group or age phenomenon. Children and young adults who show no frank disease are generally and similarly fit. The expectation is unrealistic that any conditioning program applied to a general population of any age level will produce uniform response.

The desire of each generation of parents to have its children grow up to be the sort of superb physical specimens that the parents would themselves like to have been is as old as civilization. The means most frequently chosen to attain this end has been some form of athletic participation. The selection of this means seems to rest equally on our concept that the athlete personifies physical vigor and on the practical consideration that it is easier to gain the cooperation of children in games and sports than in other forms of activity.

War has always been the most potent stimulus toward seeking greater fitness in the population, though the industrial revolution, with its example of physical degradation incident to urbanization and coupled with long working hours under miserable conditions, also served to intensify the cries for a "sound mind in a sound body," across the European world. Between periods of crisis such as these, the distaste with which the usual parent approaching middle age views his diminishing physical equipment suffices to make him vow that his children will never come to this but will develop all the physical attributes the parent either never had or will never have again.

In our day, with the span of useful adult years increasing rapidly, the descriptions of the decaying state of our youths' fitness are not in any real sense different from the descriptions voiced during the reign of England's first Queen Elizabeth. Again, it is children at whom the programs are primarily aimed, with at least 10 admonitions to slow down activities and avoid physical stress after the age of 30 for each lonely voice raised to advocate two-mile runs before breakfast daily for those of 50, bicycling to the office at the age of 60, or parachuting into rivers for octogenarians. Still, there have always been critics of those who stress conditioning of children. Aristotle said in his "Politics," "Of those states which in our own day seem to take the greatest care of children, some aim at producing in them an athletic habit, but they only injure their forms and stunt their growth. . . . The evil of excessive training in early years is strikingly proved by the example of Olympic victors; for not more than two or three of them have gained a prize both as boys and as men; their early training and severe exercises exhausted their constitutions. When boyhood is over, three years should be spent in other studies; the period of life which follows may then be devoted to hard exercise and strict diet."

It is not our purpose to join forces on either side of this argument. We simply wish to present data on various forms of fitness testing which we feel are adequate to support the statements that fitness at best is a vague concept which can only be defined in terms of the purpose for which the individual desires to be fit, that fitness at a given moment may fail to reflect or predict fitness as briefly as six

---

From the Child Research Council, University of Colorado School of Medicine.

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

months from the testing, and that fitness at the time of testing may vary remarkably dependent on the standard of measurement employed.

Methods of Study at Child Research Council

The Child Research Council has been engaged for the past 28 years in a form of investigation involving repeated examinations of the same group of individuals at intervals during their entire life spans. The childhood period is interesting and important, but it seems reasonable to suppose that much of its interest and importance is derived from its impact on the events to come in the much longer span of maturity and senility. We feel that one of the major deficiencies in our knowledge of human biology is the lack of serial investigations on man which would not only permit us to know what happens throughout childhood but also give us an opportunity to trace the influences of these childhood events insofar as possible in the mature person. With regard to the present discussion, for example, we hope to be able to say in the years to come whether, as an adult, the child who was athletic and apparently fit before and during adolescence is more or less fit and longer or shorter lived than his contemporary whose measurable fitness was less outstanding in his growing years and whose participation in athletics consisted of ownership of season tickets to all the athletic events. To this end we have been administering bicycle ergometer tests to our subjects for the past 18 years, and we have added other forms of testing within the limits of our situation as the tests became available and attained acceptance. The ones in charge of this discussion very kindly granted us permission to present data for the entire span of years we have covered in this program rather than limiting us to the age of 12 years.

The study series of the Child Research Council is composed of children born in middle and upper middle class Caucasian families in Denver. Because of this selection, any limitation of nutritional, educational, athletic, or other opportunities is largely the result of individual choice rather than environmental pressures.

The presentation of data representing the performance of single individuals, where only a very few can be crowded in to the space available, is always subject to the danger of selection on the basis of proving a point with a series of three or four cases. We were somewhat protected in this instance because of the orientation of this discussion. In accordance with that orientation, we divided our children into three groups: (*a*) those who have participated in team sports where they have been subjected to organized programs designed to increase their physical fitness with an eye to competing with other teams; (*b*) those who have been more individual in their activities and whose conditioning depends practically entirely on their own initiative and energy; and (*c*) those who have never wilfully participated in athletics and have taken part in compulsory physical education in school only under protest. From these we then selected the three individuals in each category for whom we had the longest and most nearly complete follow-up records. The grouping of individuals in the figures was done with deliberate bias, which will be explained separately for each figure.

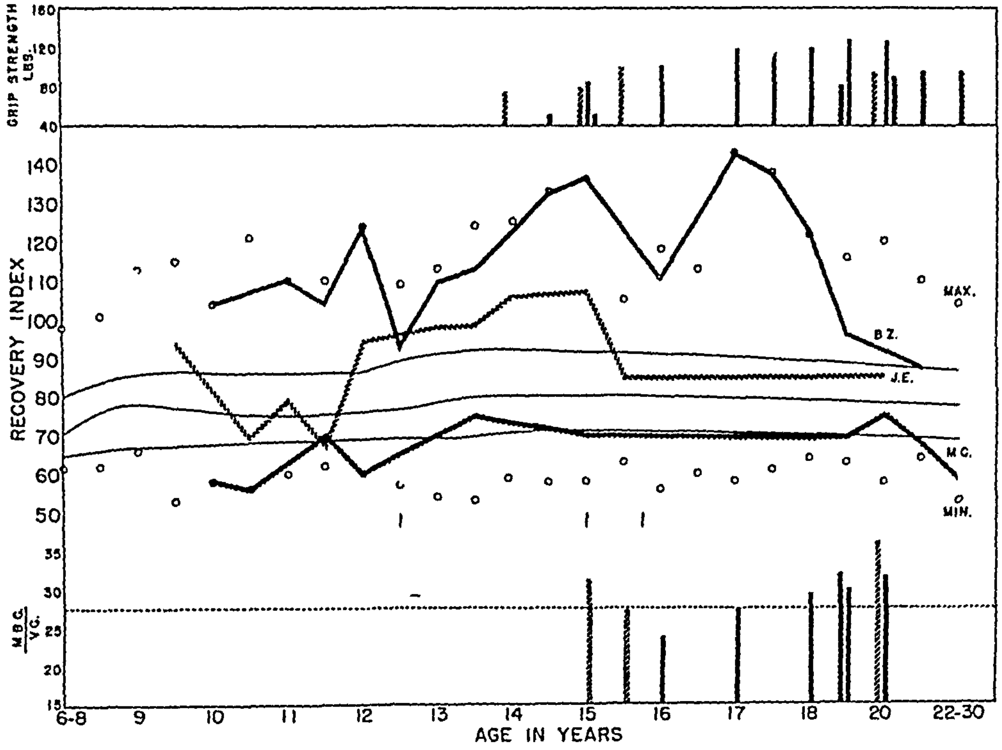


Fig. 1.—Physical fitness values for team athletes (solid line), individual athlete (striped line), and nonathlete (line of circles).

The material presented in the figures represents the results of four tests performed periodically on the subjects of the Child Research Council. The central line graph gives the range of scores by sex for the pulse recovery index, as calculated by the formula of the Harvard Fatigue Laboratory, after four minutes of exercise on the bicycle ergometer with the friction load adjusted in such fashion that the subject does ±5% of the same amount of work that he would have done on a standard step test. The circles above and below the central lines represent the maximum and minimum scores recorded for each age. The things which have interested us about these data are the relatively narrow range of distribution for the middle 50% of the group, the marked skewing of the data upward as compared with the minimal spread below the 25%, and the flat nature of the curve. Apparently, whatever the faults of this measurement, it does successfully eliminate differences due to increases in musculature and maturity.

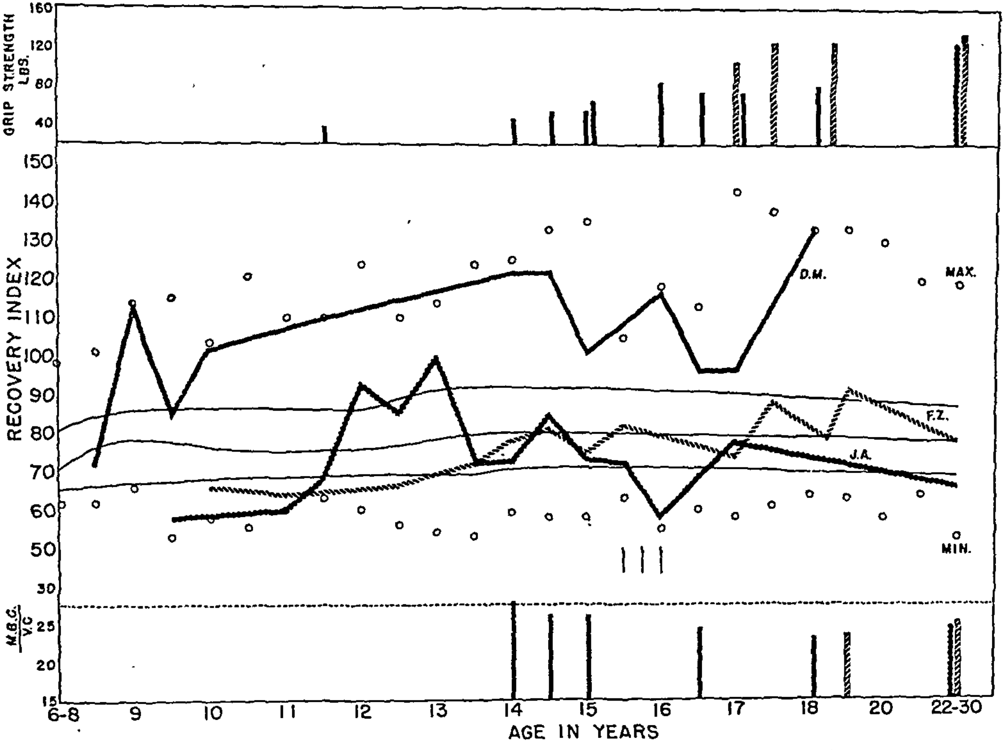


Fig. 2.—Physical fitness values, showing consistency of scores in three categories of activity for team athlete, individual athlete, and nonathlete.

The upper bar graphs give the grip strengths of the children represented. We have insufficient data at this time to establish meaningful standards for our group, but at least this permits us to compare one measure of muscle strength within these children.

The lower bar graphs represent a rather complex respiratory ratio, derived by dividing the maximum breathing capacity per square meter per minute by the vital capacity per square meter. It should be pointed out that this permits a child to show a high score either by having a relatively high maximum breathing capacity or by having a relatively low vital capacity. We have used this ratio in an attempt to express respiratory efficiency within the individual. It has the characteristic of dropping rather remarkably in a child who adds fat to the point of frank obesity. At this time we make no claims for it except to say that it seems to fit no better and no worse with our general appraisal of the subjects than the other tests used. The dotted line simply indicates the middle of the range we encounter in our subjects to give some idea of the situation of these children compared with the total group in the absence of enough data to make standards meaningful.

The small arrows indicate the age of maximum growth in height during adolescence for each of the children presented, both to give an idea of the developmental status of the subjects at any given point on the age scale and to illustrate how smoothly Aristotle avoided a difficult problem when he disposed of the whole subject of variation in the age of physical maturation by saying simply "when boyhood is over." Extreme as the differences represented here are, with the earliest peak of adolescent growth at 12 years and six months and the latest peak at 15 years and nine months, they do not represent the extremes found even in our relatively small group of less than 100 boys. The median age for maximum adolescent growth in boys for our series is 14 years, which suggests that considering childhood as terminated after the age of 12 is not only arbitrary but also erroneous.

Comparative Results

The three children grouped in figure 1 were placed together to show that, with proper selection, it is possible to fit all or most of the common concepts regarding the superior scores of the conditioned athlete no matter what type of measurement is used. The boy represented by the solid black lines was active in many sports, both as a member of his school teams and in the various "little leagues." He represents the maximum recovery index at more ages than any other child on the series. It is also true that he shows another facet of expected response, in that he stopped being active in any athletics except skiing when he finished his freshman year in college and since then has shown an abrupt drop in his score. The boy represented by the diagonally striped lines is the individual athlete, being active in swimming, skiing, tennis, and mountaineering. Although somewhat limited by going to college, he has still managed to remain active and his scores have remained fairly constant. The boy represented by the line of circles is one of the "contentedly unfit," who has successfully avoided participation in athletics and other physical activity. The fact that he had moderate asthma throughout childhood, which cleared when he was about 15 years old, may have accounted for some of his distaste for physical activity, but since he has been free from symptoms his scores have not improved.

The grip strengths of these three boys tell the same story. The conditioned athlete is clearly stronger than either of the others, and he maintains this superiority and continues to show some increase even after his recovery score has dropped. The individual athlete, while not able to match the organized athlete except briefly when he had completed his adolescence and the team athlete was just entering his, still has no trouble in staying ahead of the nonathlete in muscle strength.

In the respiratory ratio graph, however, the conditioned athlete falls behind both of the others and the individual athlete is superior. It is interesting that the nonathlete, in spite of his asthma, manages to attain a very good score, but it should be recalled that this is a ratio between two respiratory measurements and his score is aided by his relatively low vital capacity.

Finally, the early-maturing boy in this group is not the one who is athletically inclined in the usual sense, and the two extremes in athletic participation and fitness measurements are really much closer to each other in age of maturation than either is to the early-maturing boy.

In figure 2 the symbols represent the same categories as in figure 1. Again, the team athlete outstrips the other two, but this man failed to show any drop in his scores after the age of 16 when he practically stopped his participation in athletics in favor of working on his hot rod. In muscle strength, however, he is clearly below the other two boys and is actually below the median for boys of our study series. There is much less differentiation between the recovery scores of the individual athlete and the nonathlete than we saw in the first group of three. At one point, the nonathlete became athletic. Because of his late adolescence he was still preadolescent when he entered high school, and he was so anxious to demonstrate his masculinity that he went out for and made the beginning football team, in competition with boys much more advanced in maturation than he was. The score at 15 years and six months was obtained shortly after the close of the football season that year, and the dip at 16 coincided with his dropping out of football because he no longer felt the urge to prove he was a man after he had physical evidence of it.

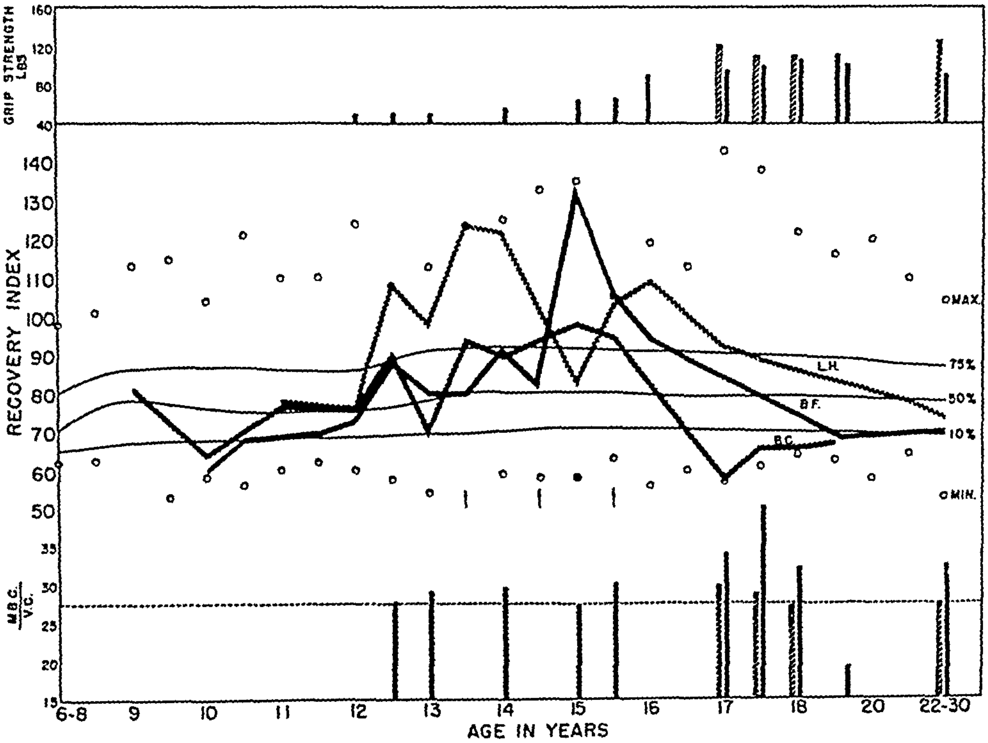


Fig. 3.—Physical fitness values, showing similarity of scores in team athlete, individual athlete, and nonathlete, engaging in three categories of activity.

The individual athlete in this group, while one of the largest boys in our group, took only a desultory interest in the organized athletic programs available to him, never went out for any school team, and preferred to spend his time and energy fishing and hiking, activities which he maintained through two years of military service and now continues as a civilian. After a slow start, his recovery index has shown a steady rise and is now in the upper half of the group. His muscle strength, as might be expected from his large size, is well up in the group, though not superior to that of the nonathlete in any significant degree. As adults, the respiratory ratios of the three subjects are quite similar, which is interesting in view of their markedly different physical builds and diverse past experiences in physical conditioning. They are also very similar in the age at which they attained the maximum rate of adolescent growth, being grouped in a six months' period starting 18 months later than the median for the boys of our series.

In figure 3, also, the solid line represents the team athlete, the diagonal stripe the individual athlete, and the small joined circles the nonathlete. If we consider the over-all picture, these three boys are not very different from each other in their scores on the bicycle. If there is a long-term edge held by any of them, it would have to go to the individual athlete, who was a runner because he liked to run in much the same fashion as Europeans run for exercise. In high school and in college he ran the mile in track, but in our area there is no competitive track activity before high school and he ran as much and as well before high school as he did afterward.

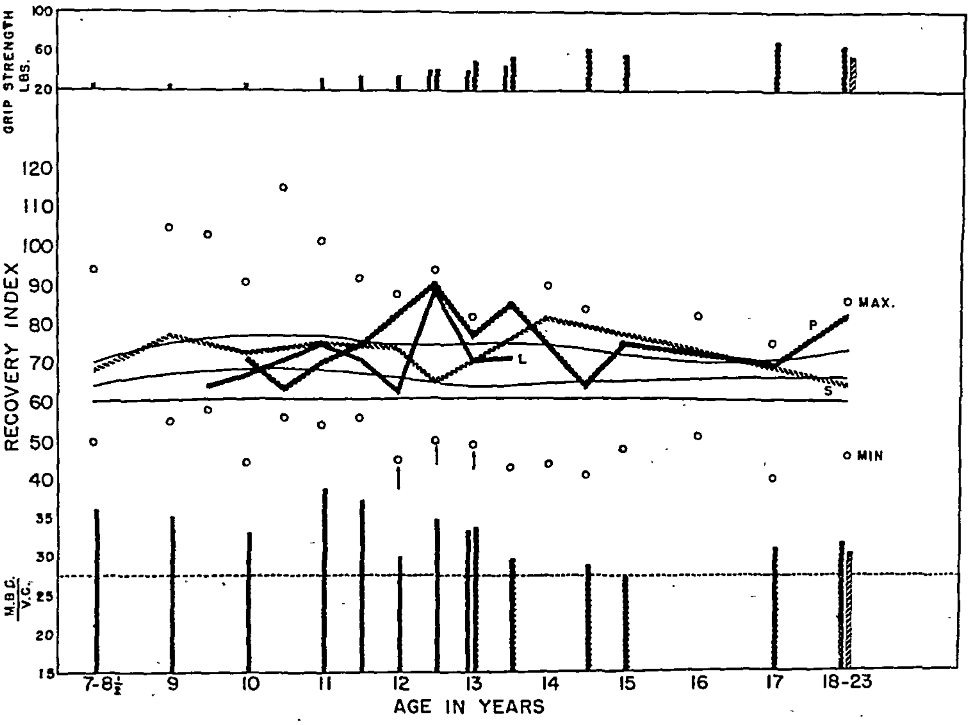


Fig. 4.—Physical fitness values in three sisters, showing similarity of scores.

The nonathlete is the brother of the nonathlete on the first chart, and, while he had no asthma, he showed the same disinclination to involve himself in athletics as his brother did. In spite of this, his scores in the early years compare well with those of the other two in all parts of the testing. At 15 years of age, he was sent to a private school where athletic participation was compulsory as a daily portion of the school curriculum, and then he went to a military school, which he still attends, where physical conditioning is part of a way of life. If these experiences have changed his physical condition, the reflections of the change in the physically stressful bicycle test are clearly for the worse, and it is only in the respiratory index that he has shown any visible improvement.

The team athlete in this group is perhaps the most interesting child and young man to be presented. From his early school days to the end of high school, athletics and physical conditioning were almost a religion to him. In spite of his ordinary muscular strength, his median age of adolescence, and his small physical size of 130 lb. (59 kg.) on a 5-ft., 8-in. (172.7-cm.) frame, he is the most accomplished athlete of our group, at least in the sense of recognition of his accomplishment. He was all-conference selection in football, basketball, and baseball each of his last two years in a tough city league, and in basketball he was repeatedly chosen by the local sports writers as the high school athlete of the week. Yet, except for the peak just after his maximum growth period and just before he entered high school, his scores on the bicycle have been ordinary enough and the decline which started during the years of intensive training was not increased in slope when he stopped athletics as a busy college student earning much of his way as a shoe salesman. Now, as a truly physically decadent medical student of 23 years, his score precisely matches his scores of 10 and 11 years when his life was filled with athletics instead of prescriptions and diagnoses.

Figure 4 was assembled to show that we do not neglect the girls. It is difficult to match the categories we set up for the boys, so we selected three sisters, one of whom may be termed athletic during the past two years since she took a serious interest in ballet. The other two have never been athletically inclined. Except for the graphic symbols, which still present the "athlete" as the solid line, it would be impossible from any of the tests to separate these girls. The established lesser muscle strength of girls is well illustrated by the grip strength results. The respiratory scores of the girls, however, are well above those shown by any of the boys. We have laughingly passed this off as expected, since everyone knows women are windier than men. But if we take a look at census or actuarial figures on the sex of those who live the longest the laugh becomes less fun.

In keeping with the general trend of those who concern themselves with fitness to make sweeping statements on limited data, we would like to point out that these three sisters raise the possibility that what we measure and term fitness is as much on a familial basis as on an environmental basis. At least so far as the bicycle ergometer scores are concerned, other siblings show the same close grouping in general as these girls show, whether they are of one sex or both. With the exception of the nonathletic brothers previously shown and one other family, the results obtained on siblings could be transferred from one child to another within a family without dislocation of the trend of any child. We do not present this as establishing a hereditary element in fitness, nor could such an element be established on a group such as ours. We do want to emphasize that the basic material which is being worked on must be taken into account along with the manner in which it is processed in the production of superior physical fitness as in the production of any other commodity.

Summary

The data collected by the Child Research Council support the point of view that children and young adults who show no frank disease are generally and similarly fit. The response to conditioning programs, such as athletic participation, is a highly individual thing rather than a group or age phenomenon, so that the expectation is unrealistic that any conditioning program applied to a general population of any age level will produce uniform response. Various measurements of fitness and response to conditioning, when applied to the same individual, give different answers, suggesting that current testing methods omit consideration of the question, "fitness for what?" There is as yet no evidence that athletics or other forms of physical activity produce any measurable or lasting benefits when applied only to children, and such adult work as is available indicates that, to be of value, the activities must continue through the major portion of the life span of the individual.

4200 E. Ninth Ave. (Dr. McCammon).

SUBDURAL HEMATOMA IN THE ELDERLY PERSON

Peter Stuteville, M.D.
and
Keasley Welch, M.D., Denver

The course of subdural hematoma was studied by reviewing the hospital records of 75 patients, 65 years of age or older, in whom the condition was demonstrated either at operation or at autopsy. The symptoms were such that the condition might easily have been mistaken for senile degeneration of the brain, cerebral vascular disease, or other conditions. Of the 30 patients who underwent operation, 17 survived and improved, while the typical course observed in 45 patients who did not undergo operation was a quiet, gradual decline, frequently terminated by sudden and unexpected death. The importance of early diagnosis and prompt operation was demonstrated. Although subdural hematoma in the elderly patient is a subtle disease, frequently disguised, it may be possible to increase the accuracy of diagnosis by keeping this condition in mind, diligently utilizing such diagnostic means as angiography, and resorting more readily to surgical exploration.

Subdural hematoma may occur at any age, and its manifestations depend on the age of its victim. The particular characteristics of the disorder at the earliest extreme of life have received wide attention, while its features at the other extreme have not. It has, however, been realized that in elderly patients subdural hematoma may mimic vascular disease or senile degeneration of the brain and that this diagnosis may be extremely difficult.[1] Moreover, the results of treatment have been poor. For these reasons, a study of the problem was undertaken in the hope that the clinical features of the disorder might be clarified and earlier recognition and treatment might thus be permitted.

Analyses [2] of large series of patients of various ages with subdural hematoma has drawn attention to the fact that the only consistent historical incident is one of trauma to the head. These studies and others [3] emphasize the variability of clinical manifestations that may appear and the unreliability of particular physical signs as a basis for diagnosis, in any age group. It is worth noting that in these extensive series patients over the age of 65 years make up only a small portion of the total numbers.

From the Division of Neurosurgery, University of Colorado Medical Center.

Read before the Section on Nervous and Mental Diseases at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

This study is based on a review of hospital records of 75 patients 65 years of age or older who had proved subdural accumulations sufficient to cause mental disability, physical disability, or death. The patients whose records were examined comprised all in this age group in whom the lesion was confirmed either by surgical exploration or by autopsy during the past 15 years at Colorado General Hospital, Denver General Hospital, and the Denver Veterans Administration Hospital.

Analysis of Cases

Age, Sex, and Race Distribution.—By far the largest number of patients (78%) were white males; only 18% of the patients were white females; and 4% were Negroes. The 75 cases studied were made up of patients between the ages of 65 and 92 years. Of these, there were 28 (37%) aged 65 to 69, 15 (20%) aged 70 to 74, 16 (21%) aged 75 to 79, 11 (15%) aged 80 to 84, 3 (4%) aged 85 to 89, and 2 (3%) aged 90 to 92.

Chief Complaints.—Escorting relatives or friends were, not infrequently, the sources from which examiners drew the reasons for a patient's delivery to the hospital emergency room or admitting ward. Often, the reasons stated seemed to represent inferences rather than quotations of complaints previously made by the patient himself.

Of these 75 patients, 32% (24) were brought into the hospital because they had suffered some kind of injury; 16% (12) because they had shown signs of mental or personality changes; 13% (10) because they were unconscious and could not be awakened; 11% (8) because of constant and severe headaches; and 4% (3) because of a neurological disability such as a hemiplegia. Twenty-four per cent (18) sought admission for medical or surgical diseases of other systems.

Trauma.—In the present series, 4% of patients entered the hospital comatose and without accompanying history of any kind. For the most part, these patients were old men who lived alone in rooming houses, where they had been found unconscious by acquaintances. A history of trauma was elicited in 71% of the cases; 31% of the patients had suffered overt trauma, as from road accidents or assault. The remainder simply had a history of falling. Four patients, resident in the hospital for nonneurological conditions, were injured on the wards, either by falling out of bed or by striking an open door during the night. In slightly less than one-fourth of all the cases, no history of trauma could be unearthed. A similar proportion of all the patients fairly certainly had been drinking at the time when the illness began.

Physical Findings.—Physical signs of increased intracranial pressure rarely were encountered. Of the patients studied, only 12 could be said to have been awake, alert, and mentally intact at the time when they were first examined; of these, 4 were injured later on the wards. The remaining patients were confused, demented, stuporous, or comatose.

Bruising about the head was remarkably frequent, being noted in over one-half of the patients. Focal neurological signs were of course, common, but since many of the patients were not examined with neurological disturbances in mind, only a rough estimate can be made about their actual frequency. Common physical findings in the patients were an alterated state of consciousness in 63 (84%) (confusion in 15 [20%], stupor in 22 [29%], and coma in 26 [35%]), bruises on the head in 44 (59%), mild arterial hypertension in 17 (23%), pupillary abnormalities in 29 (39%), speech difficulties in 11 (15%), bilateral extensor toe signs in 13 (17%), hemiparesis in 18 (24%), and evidence of alcoholism in 19 (25%).

Admitting Procedures.—As might be expected, the majority of patients with obvious head injuries were admitted to the neurosurgical service; 27% of all patients went initially to that service. Another 11%, chiefly those with clear-cut, but apparently nontraumatic, neurological disease went to the neurological service. Two patients went to the psychiatric service because of their dementia. Thirteen per cent went to a surgical or to a surgical subspecialty service with complaints or signs of such things as urinary retention, fracture, bowel obstruction, and the like. Almost half of the entire series was first admitted by the medical service. Of this number, 25% were accepted because of a history or signs of nonneurological disease such as disorders of the lungs and heart. The rest were deemed to be suffering from vascular accidents of the brain. The diagnosis on admission was subdural hematoma in 8 (11%), head injury in 19 (25%), neurological disease in 26 (35%), medical disease in 9 (12%), psychiatric disease in 3 (4%), and surgical disease in 10 (13%).

Hospital Course.—Failure to improve followed, at times, by a quiet and gradual decline and, at other times, by sudden and unexpected death seems to have been the pattern in those patients who did not come to operation. Thirty of 75 patients were said to have died suddenly or unexpectedly.

Cerebrospinal Fluid.—The cerebrospinal fluid pressure was completely normal in almost three-fourths of the 42 tests performed. Fluids altogether normal in appearance and cellular content were obtained in 40% of specimens while the remainder were xanthochromic or bloody. The protein content was analyzed in only 20 of the 42 specimens, and in 9 patients the protein level was within normal limits. Sudden death followed in one instance of cisternal puncture and in two instances of lumbar puncture.

X-rays of the Skull.—Over half the patients studied had no x-ray of the skull made at any time during their hospital stay. Of the x-rays of the skull that were obtained, one-third showed a fracture line and one-fifth definite displacement of a calcified pineal.

Operative Results.—Explorations were carried out in 30 cases. Although some 42 patients were suspected, on clinical grounds, of harboring a clot, 12 failed to reach surgery, because, in almost every instance, the patient had deteriorated beyond the point where neurosurgical intervention could be begun or completed before his death.

Of the 30 patients operated on, 57% survived the operation to improve, while the remainder died postoperatively. In half the postoperative deaths, failure to respond resulted from a reaccumulation of the clot; in the other half, such pathology as massive cerebral edema and intracerebral hematomas was found at autopsy. Contrasted to the over-all figures are the figures in the 20 most recent cases, in which 19 patients were given a diagnosis and operated on and 11 survived.

Report of Cases

Taken alone, statistical analysis of the data drawn from this inquiry is not enough to afford satisfying insight into the clinical features of subdural hematoma in the elderly patient. Simultaneous study of individual case histories is essential if the essence of the malady is to be understood.

The first case report exemplifies the commonly encountered situation in which an old man is brought to the admitting ward by relatives or friends who have noticed recently that something has been wrong with him. The patient, approached by a physician and questioned about his troubles, is likely to be grossly confused and totally unaware of the reason for his family's concern. Consequently, he tends to draw attention to such irregularities of function as his cough or his difficulty in passing urine. Duly noted, this complaint is pursued while the confusion or dementia is attributed to senility.

Case 1.—The patient was a 66-year-old man who was brought to the emergency room by his family. When questioned, he complained of frequency and urgency of some two to three years' duration. He was examined and was found to have a large prostate gland, to be confused, and to have a minimal right-sided hemiparesis with appropriate reflex changes. He was admitted to the urologic service, where cystoscopy was done and a lumbar puncture was made. On his eighth hospital day, he died suddenly and unexpectedly. Postmortem examination revealed a large, left, subdural hematoma and a massive pulmonary embolus.

Not infrequently, cerebral vascular disease seems to be a reasonably acceptable basis to account for the patient's presenting difficulties.

Case 2.—The patient was a 92-year-old man who was brought to the hospital unconscious. Ten years earlier, he had had a "stroke" that had left him mildly hemiparetic on the right side. Three days before admission, he was said to have had another "stroke." There was no history of trauma to the head. After the second attack, he went through intermittent periods of unconsciousness which gradually grew longer and more frequent until he could not be aroused. He had been noted to be somewhat weaker than usual on his right side. Examination at the hospital showed him to be profoundly comatose, to have a right-sided hemiplegia with absent tendon reflexes on that side, and to have a right extensor plantar response. He was brought into the hospital and treated supportively. He failed to improve over the next four days and finally died of extensive, bilateral, subdural hematomas.

The following case points up the fact that the early complaints of many patients of this age with subdural hematoma may be nonspecific.

Case 3.—The patient was a 76-year-old man who had been in good health until 10 days before the time when he appeared at the hospital. At the onset of his illness, he was said to have had the "flu," and he was treated for this by his family physician. During the course of treatment, however, the patient appeared to be "dull," and he complained often and bitterly of severe and constant headache. Finally, he became somnolent, and, at this point, he was referred to the hospital. Examination showed him to be in and out of stupor and to exhibit a left-sided hemiparesis with generally symmetrical but hyperactive deep-tendon reflexes and with bilateral extensor plantar responses. Lumbar puncture yielded conspicuously xanthochromic fluid under a pressure of 300 mm. of cerebrospinal fluid. Cerebral arteriography disclosed the presence of a subdural hematoma on the right side. Evacuation of the hematoma was followed by recovery.

Reminiscent of the situation often seen at the other extreme of life is a simple failure to thrive, physically and mentally, because of a subdural hematoma.

Case 4.—The patient was a 78-year-old man who had been sent to a nursing home by his family because of near starvation and from the nursing home to the hospital because of progressive deterioration in his nutritional state. At the time of admission, the patient was cachectic, lethargic, and irritable, but he displayed no focal neurological disturbance. In the hospital, he was investigated thoroughly, but no specific reason for his decline could be established. Throughout his 11 weeks in the hospital, and despite vigorous and conscientious medical management, he failed to improve. Finally he became even less responsive, developed cyclic breathing, and shortly thereafter died. Postmortem examination showed bilateral chronic subdural hematomas and pulmonary infarction.

Comment

Clinical Features.—The present study was undertaken with the hope of clarifying the clinical features of subdural hematomas in elderly persons and thereby making it possible to distinguish the disease from others producing similar manifestations. Unfortunately, this objective was not wholly attained, since elderly patients with this malady proved not to present consistently characteristic pictures. None the less, it has been possible to define a variety of clinical situations sometimes associated with this disease.

The first such situation is one in which there is a definite initiating injury, as from a serious fall, automobile accident, or an assault. The patient tends not to improve but may do so slowly and incompletely. He may remain or become confused, demented, or somnolent and develop signs of neurological deficit. In such cases, a surgical lesion can be usually diagnosed with relative ease, and surgical exploration or angiographic study can be used with but slight hesitation. There are, however, patients in whom the clinical course, even after a definite initiating injury, has so much of the flavor of cerebral vascular disease that the suspicion of subdural hemorrhage is not entertained.

A second situation (and it is the one which involved the majority of our patients) is one in which a history of trauma is sometimes not elicited or is denied. If remembered, injury has been considered to be trivial, and one or several minor falls have been interpreted as symptoms rather than causes of the patient's illness. The patient, often too confused to give a reliable history, is frequently sufficiently well enough preserved to give a misleading one. Under such circumstances, he may be admitted to almost any service in the hospital for treatment of his accepted senility plus his "stroke," his pulmonary disease, his heart failure, or other obvious physical disability. Later in his hospital course, he declines more or less markedly and rapidly to become somnolent or comatose. Carefully examined, he usually will be found to have bruises of the scalp, sometimes indistinct and fading, often concealed beneath the hair. Although by no means constant findings, there may be such neurological abnormalities as a hemiparesis with single or double extensor toe signs.

Guillaume and Œconomas,[1a] describing their observations of patients of this category, state that ordinarily they exhibit asthenia, headache (constant or varying with postural changes), diminished intellectual activity, loss of initiative and of memory, and poverty of ideation. More recently, Bedford [1b] has made the following observation:

> Typically the history is that the old person, already somewhat enfeebled, has recently become mentally confused: medical advice or admission to hospital is sought for this latter symptom. A history of a fall within the preceding weeks or months may be elicted—usually by direct questioning—and has been attributed to "old age" or to a "little stroke." The fall may have been accompanied by transient unconsciousness or epileptiform jactitations (and it may be observed here that although a fit is only rarely a symptom of subdural hematoma, it is by no means a rare cause of the fall which leads to the blow on the head—trivial or otherwise—which is its almost invariable antecedent). Physical examination only rarely contributes substantially to the diagnosis. The usual clinical picture is that of a mentally confused old person with some impairment of intellectual capacity (which may be slight, moderate, or profound), who may be somewhat or deeply drowsy—but is as often not—and who may or may not have bruising about the eyes and forehead: there is often evidence of damage to the pyramidal systems, and occasionally pupillary abnormalities not unjustifiably attributable to ocular disease, which also hinders adequate retinoscopy. Very often, too concomitant disease of other systems—a fractured neck of femur, bronchopneumonia, heart failure, or uremia—provides further diagnostic distraction.

Less commonplace clinical situations are exemplified by the case reports of patients who simply failed to thrive, mentally and physically, or who complained early of insistent and severe headaches but showed no physical signs.

Diagnosis.—Bedford [1b] pointed out the difficulty and complexity of diagnosis by noting that fully 80% of 5,000 elderly people admitted to the Oxford Geriatric Unit over an eight-year period were confused—no matter what the diagnosis. His experience with x-rays of the skull and with lumbar puncture resembles ours. Similarly, his diagnostic accuracy approximates our own. In this regard he says: "Indeed, despite the utmost vigilance, only 40% of my elderly cases were diagnosed in life. . . ."

On the other hand, we fail to share the misgivings reflected in his statement that: "It must reluctantly be admitted, therefore, regarding the diagnosis of subdural hematoma in the aged, that unless thousands of old people are to be submitted needlessly to an unjustifiable intracranial exploration, every physician concerned in their care will see a number of patients each year in whom the condition unavoidably defies detection, and this unsatisfactory state of affairs is not materially improved by the knowledge that even without surgery, these effusions are not invariably lethal." Our point of view on this score is based on the fact that of our 20 most recent cases, 19 were recognized in life, admittedly while a certain number of fruitless (but by no means unjustifiable) diagnostic procedures were made in patients without such disease.

Finally, it seems prudent to stress the importance of early diagnosis, if diagnosis is to be made in a living patient and if treatment is to be effectual. Time and again we have encountered instances of sudden and unexpected death caused by subdural collections. Furthermore, the beneficial diagnoses were made early, and treatment too long delayed commonly failed.

Frequency.—From our data, we cannot estimate the actual incidence of subdural hematomas in the aged. Bedford,[1b] however, found the disease in 1% of a rather large group of hospitalized patients over 65 years of age.

Treatment.—Our own proportion of unfavorable results of treatment makes us hesitant to defend any particular method of management. In our cases, liquid clots were drained between bur-holes, and the occasional solid clot required a larger bony opening for its removal. During the past two or three years, we have made it a matter of policy to reoperate on any patient who declined anew after surgery or who failed to rally as expected. In certain instances we have reoperated as many as four times to be gratified, eventually, by the patient's recovery. Our experience with LaLonde's and Gardner's[4] method of spinal injection of saline solution is not extensive enough to allow us to form an opinion about its merits. From the limited use that we have made of this maneuver, we are certain, however, that it does not always make subsequent operations unnecessary.

Summary

In the elderly person, subdural hematoma is a subtle disease frequently disguised so that it may be taken for senile degeneration of the brain, cerebral vascular disease, or other conditions. Although early diagnosis is difficult, it is essential; first, because the clinical course of a patient with a subdural hematoma frequently is terminated abruptly by sudden and unexpected death and, second, because treatment too long delayed often fails.

Despite the lack of an easy solution to this problem, our experience suggests that it may be possible to improve this difficult state of affairs by cultivating an attitude of suspicion and by readily resorting to angiography or exploration in the older patient when the diagnosis can reasonably be entertained.

References

1. (*a*) Guillaume, J., and Œconomos, D.: Collapsus cérébral et hématomes sous-duraux, Rev. neurol. **84:**185-187 (Feb.) 1951.

(*b*) Bedford, P. D.: Discussion: Intracranial Haemorrhage—Diagnosis and Treatment, Proc. Roy. Soc. Med. **51:**209-213 (March) 1958.

2. Gardner, W. J.: Traumatic Subdural Hematoma, with Particular Reference to Latent Interval, Arch. Neurol. & Psychiat. **27:**847-858 (April) 1932. Gardner, W. J., and Shannon, E. W.: Study of 27 Cases of Chronic Subdural Hematomas, Ohio M. J. **39:**835 (Sept.) 1943. Munro, D.: Cerebral Subdural Hematomas, Study of 310 Verified Cases, New England J. Med. **227:**87-95 (July 16) 1942.

3. Bergman, P. S.; Nathanson, M.; and Friedman, E. D.: Results of Exploration in Patients with Clinical Diagnosis of Subdural Hematoma, J. A. M. A. **149:**1529-1532 (Aug. 23) 1952. Echlin, F.: Traumatic Subdural Hematoma—Acute, Subacute, and Chronic: Analysis of 70 Operated Cases, J. Neurosurg. **6:**294-303 (July) 1949. Kennedy, F., and Wortis, H.: "Acute" Subdural Hematoma and Acute Epidural Hemorrhage, Study of 72 Cases of Hematoma and 17 Cases of Hemorrhage, Surg. Gynec. & Obst. **63:**732-742 (Dec.) 1936. Laudig, G. H.; Browder, E. J.; and Watson, R. A.: Subdural Hematoma, Study of 143 Cases Encountered During 5-Year Period, Ann. Surg. **113:**170-191 (Feb.) 1941.

4. LaLonde, A. A., and Gardner, W. J.: Chronic Subdural Hematoma, Expansion of Compressed Cerebral Hemisphere and Relief of Hypotension by Spinal Injection of Physiologic Saline Solution, New England J. Med. **239:**493-496 (Sept. 30) 1948.

TRAINING FOR ESCAPE FROM A SUBMARINE.—In water-filled towers 120 feet high, all submarine personnel undergo regular training in a method of individual escape from a disabled submarine. This training, known as bouyant-assisted ascent, is conducted at increasing depths down to 100 feet. In principle, the method is simple: the trainee, wearing an expanded life jacket, steps out of a pressurized lock into the interior of the column of water where he is held on a platform by two instructors. On a signal from one instructor, the trainee forcibly expels the air from his lungs until he approaches residual lung volume. At this point he is released and rises to the surface at a rate of 300 feet per minute. Throughout the ascent the trainee must continue to blow out air, since the compressed residual air in his chest expands rapidly in accordance with Boyle's Law and can produce over distention of the alveolar structures, resulting in massive arterial air embolism. It is because of this potentially fatal hazard that the Submarine Medical Officer must be in constant attendance, working in the water with the instructors during escape training. In the event of a casualty, the doctor and victim are in a topside recompression chamber and at a treatment pressure of about eighty pounds per square inch within ninety seconds after the accident. This pressure reduces the volume of the air emboli that have flooded the left heart, coronaries, aorta, and cerebral vessels, permitting a resumption of blood flow and survival of the stricken individual, in most cases. . . . Aside from its value as an escape training device, the tank serves as a research medium in which a wealth of data on respiratory physiology is constantly being accumulated by our submarine doctors.—Rear Adm. B. W. Hogan. M.C., Surgeon General, U.S.N. The Practice of Submarine Medicine, *Medical Arts & Sciences*, Second Quarter, 1958.

CLINICAL NOTES

IMPORTANCE OF AUTOPSIES—AN ILLUSTRATIVE CASE

Jack Marks, M.D., Columbus, Ohio
and
Kenneth L. Gerson, M.D., Cleveland

The autopsy examination is sought for a variety of reasons, including augmentation of medical knowledge, clarification of cause of death for medicolegal reasons, and the disclosure of hereditary and infectious disease that might have valuable bearing on survivors.[1] Many of these reasons, however, represent abstractions to next of kin and make no real impression on them.[2] We wish to present an instance wherein the information obtained from an autopsy examination was of critical importance to a family member and may be instrumental in the prolongation of life.

Report of a Case

Our patient was a 15-year-old male initially seen in the outpatient department of the Ohio State University Hospital on Feb. 10, 1958, because of a chest deformity noted at the time of birth and of the type similar to that of the patient's deceased father. He had no symptoms of illness and had experienced no disability whatever with his deformity. He had no particular embarrassment over his chest deformity and enjoyed basketball and other vigorous sports. The patient's medical history included surgical repair of a scrotal varicocele at age 5 and trauma to the right eye, which left a residual coloboma of the iris.

On physical examination, our patient was a thin, tall, white male with a chest deformity of the pectus carinatum type. His height was 73 in. (185.4 cm.), the measurement from pubis to heel was 42 in. (106.7 cm.), measurement from pubis to vertex was 31 in. (73.7 cm.), and the arm span was 75 in. (190.5 cm.). His weight was 126 lb. (57.2 kg.). Blood pressure was 110/68 mm. Hg in both arms. Pertinent physical findings included elongated auricular pinnae and a post-traumatic coloboma of the right iris, with the remainder of the ocular examination thought to have been normal. The palate appeared rather high and arched in character. There was an asymmetrical anterior bulging of the left side of the thorax. The extremities showed marked symmetrical elongation of the long bones of the fingers and toes. The joints of the fingers were somewhat hyperextensible; other joints seemed normal. There were high metatarsal arches bilaterally.

Laboratory data were normal with the exception of an elevated alkaline phosphatase level of 36.5 units, for which no explanation was obtained. The 17-ketosteroid and 17-hydroxycorticosteroid levels were normal. X-rays of the skull were reported normal. A chest x-ray showed anterior bowing of the sternum. The cardiac shadow and aorta were thought to be within normal limits. X-rays of the hands and feet were remarkable only in the length of the metatarsal and phalangeal bones. An electrocardiogram was normal.

The patient has two siblings, a 17-year-old brother and a 14-year-old sister, neither of whom had been known to have any illness or deformities. The father had died at age 33 in congestive heart failure with a final clinical diagnosis of rheumatic heart disease and possible subacute bacterial endocarditis. He had had six siblings, of whom all are living and well with no known abnormalities. The paternal grandparents lived long lives, and no abnormalities were known in them.

Transcripts of the father's records and slides of specimens obtained at autopsy were sent us from another hospital. It was learned that eight years prior to his death the father had been hospitalized and discharged with diagnoses of psychoneurosis, anxiety-hysteria in type; partial dislocation of the lenses, O. U.; vitreous opacities, O. U.; congenital punctate cataract, O. U.; and tremulous iris, O. U.

Diagnoses at autopsy were given, in part, as follows: old and recent myocardial infarction; nonspecific interstitial myocarditis; left ventricular hypertrophy and dilatation; marginal aortic valvulitis; and sacular aneurysmal dilatation of the ascending aorta and of the first portion of the arch of the aorta. Microscopic examination of the aorta showed medionecrosis with hyaline and mucoid transformation and interruption of the elastic laminae.

Review of the sections from the father's autopsy at the Ohio State University Health Center showed lesions in the heart and aorta as described above. These findings are identical with the changes of Erdheim's medionecrosis which are described in Marfan's syndrome.[2A] On the basis of the above, we concluded that the patient's father had had Marfan's syndrome, as did our patient.

Comment

Marfan's syndrome is an inheritable disorder probably transmitted by a single dominant autosomal gene. It has been thought to cause changes in structures derived from the mesoderm. These defects can be grouped into skeletal, cardiovascular, and ocular manifestations.

Clinical Instructor in Medicine, the Ohio State University Health Center (Dr. Marks), and Intern, Mount Sinai Hospital (Dr. Gerson).

The skeletal changes are characterized by gracile body habitus (dolichomorphism) with striking elongation of the distal bones of the extremities (arachnodactyly). Patients with this syndrome are usually tall with characteristic alterations of the proportions of the body. Typically the pubis to heel measurement exceeds the pubis to vertex measurement and the arm span is greater than the height. Involvement of the calvarium results in a long appearance of the skull (dolichocephaly). Associated changes of the skull are highly arched palate and long narrow faces. Cleft palate is a rare finding.[3]

The rib cage is frequently involved and results in a funnel-shaped chest (pectus excavatum), pigeon breast chest (pectus carinatum), or other asymmetrical chest deformities. A weakness of ligaments, tendons, fascia, and joint capsules results in hyperextensibility and recurrent dislocations of joints, pes planus, pes cavus, genu recurvatum, and hernias. Ectopia lentis, almost always bilateral, is found in 50 to 80% of the reported cases. The lens is usually small, spherical, and displaced upward. Myopia is frequent, due to excessive length of the eyeball. Retinal detachments occur frequently. Iritis and glaucoma resulting from the displaced lens may be responsible for limitation of vision or even total blindness.

The cardiocascular system is diffusely involved. Aortic insufficiency results in left ventricular hypertrophy. Diffuse interstitial myocardial changes have been described.[4] Marginal valvular thickenings have been noted, and these can be readily differentiated microscopically from those of rheumatic endocarditis. Dilatation of the ascending aorta and aneurysm are frequently noted. Dissecting aneurysm may occur as an initial sign or may follow aortic insufficiency. Defects in the pulmonary artery and the innominate and carotid arteries are less commonly seen.[5] Weakness in the walls of the veins, apparently similar to that in the arteries, may result in varicose veins.[6]

Other aspects of the disorder have been described,[7] including muscular underdevelopment and hypotonia. Deafness is reported[8] to occur in 6% of the cases. Pulmonary malformations and cystic disease of the lung have been thought to be a component of the disease. McKusick[9] has published a comprehensive study of Marfan's syndrome.

In the papers of Griffin and Koman[10] and Marvel and Genovese,[11] a total of 55 cases of Marfan's syndrome were collected, with 48 patients surviving the first year of life. Of these, there was a range of life span of 1 to 55 years and a mean life span of 27.5 years.

Wilson[2A] has recently described three generations of a family affected with Marfan's syndrome. He stated that the degree of physical activity of the individual probably is important in determining the rate at which aortic dilatation occurs. He cited a patient who led a quiet life and felt that the patient's sedentary existence had probably contributed to a prolonged life span.

We therefore counseled the parent to have our patient desist from vigorous athletic competition. We suggested that he be given a type of education preparatory for sedentary work. The significance of this disease with relation to marriage and child bearing was discussed. The counsel given the parent most certainly involves a major alteration to the patient's manner of living and might not have been justifiable without verification of the diagnosis of Marfan's syndrome.

Summary

House officers are frequently faced with the responsibility of requesting autopsy permission from next of kin. Often resistance is encountered for a variety of reasons, some of which are religious, some superstitious, and some simply based on a morbid displeasure of the concept of the autopsy examination. Too often the reasons set forth by the physician to next of kin represent abstract ideas with no apparent immediate benefit for the surviving family. We have found an instance in which information obtained from the autopsy of a father may prolong the life of his son. We believe this case to represent a valuable instance for house officers to draw on in their discussions concerning permission for autopsy with families of their deceased patients.

2620 Schaaf Dr. (9) (Dr. Marks).

References

1. Maisel, A. G.: Truth About Autopsies, Reader's Digest **68**:104-108 (April) 1956. Brown, D. E.: High Autopsy Percentage, New England J. Med. **251**:859-860 (Nov. 18) 1954.

2. Folkman, J. D.: Grief, read before staff meeting, White Cross Hospital, Columbus, Ohio, February, 1957.

2A. Wilson, R.: Marfan's Syndrome: Description of Family, Am. J. Med. **23**:434-444 (Sept.) 1957.

3. Ross, L. J.: Arachnodactyly: Review of Present Literature and Report of Case with Cleft Palate, Am. J. Dis. Child. **78**:417-436 (Sept.) 1949.

4. Pappas, B. G.; Mason, D.; and Denton, C.: Marfan's Syndrome: Report of Three Patients with Aneurysm of Aorta, Am. J. Med. **23**:426-433 (Sept.) 1957.

5. Austin, G. A., and Schaefer, R. F.: Marfan's Syndrome, with Unusual Blood Vessel Manifestations, A. M. A. Arch. Path. **64**:205-209 (Aug.) 1957.

6. Steinberg, I.; Mangiardi, J. L.; and Noble, W. J.: Aneurysmal Dilatation of Aortic Sinuses in Marfan's Syndrome, Circulation **16**:368-373 (Sept.) 1957.

7. Sinclair, R. J. G.: Marfan Syndrome, Bull. Rheumat. Dis. **8**:153-154 (Jan.) 1958.

8. Rados, A.: Marfan's Syndrome (Arachnodactyly Coupled with Dislocation of Lens) Arch. Ophth. **27**:477-538 (March) 1942.

9. McKusick, V. A.: Heritable Disorders of Connective Tissue, St. Louis, C. V. Mosby Company, 1956.

10. Griffin, J. F., and Koman, G. M.: Severe Aortic Insufficiency in Marfan's Syndrome, Ann. Int. Med. **48**:174-187 (Jan.) 1958.

11. Marvel, R. J., and Genovese, P. D.: Cardiovascular Disease in Marfan's Syndrome, Am. Heart J. **42**:814-825 (Dec.) 1951; correction **43**:320 (Feb.) 1952.

SPECIAL REPORT

FEDERAL MEDICAL-HEALTH SPENDING FOR FISCAL YEAR 1959 (JULY 1, 1958, TO JUNE 30, 1959)

The federal government's medical activities are on a massive scale and they continue to grow. This year for all health programs (research, medical care, public health) Uncle Sam is spending about 62.6% more than he did five years ago, 13.5% more than last year. Programs in 22 separate agencies and departments of government range from cancer research to federal employee clinics. The total cost is 2.8 billion dollars, or 344.7 million dollars more than last year. Right now the agencies and the Bureau of the Budget are working on requests to be presented to Congress in January. There is little question that the bills, when finally enacted next year, will set another new high for medical spending.

For six years now the Washington Office of the American Medical Association, through this annual budget report, has charted this expanding course of federal medical activity, a service not performed by any other organization. We identify all programs, describe their purpose, give their present appropriations, and note the amount of increase. We do not attempt to evaluate them—to rate them as good, bad, or indifferent; as wasteful or invaluable. This is a factual study, based on scrutiny of appropriation acts passed by the last Congress and information supplied us by program and fiscal officers in the various departments and agencies, all of whom gave us their wholehearted cooperation. It covers the current fiscal year which ends next June 30.

TABLE 1.—*Medical-Health Budgets of Federal Departments, Agencies, and Commissions for This Fiscal Year*

Agency	Fiscal 1959	Fiscal 1958	Page
Department of Health, Education, and Welfare	$1,116,207,806	$849,395,800	3-10
Veterans Administration	843,524,000	849,374,000	10-11
Department of Defense	751,115,000	702,305,000	12
Atomic Energy Commission	45,462,000	40,085,000	13
International Cooperation Admin.	39,600,000	37,300,000	13
Department of State	21,638,380	15,718,110	13-14
National Science Foundation	19,575,000	7,500,000	14
Office of Civil and Defense Mobilization	13,617,000	3,177,000*	15
Federal Employees Health Programs	11,000,000	10,000,000	15
Department of Labor	8,827,000	8,069,476	15
Panama Canal Co. and Panama Canal Zone Government	3,959,900	5,988,300	16
Department of Treasury	3,854,500	3,837,850	16
Department of Justice	2,105,000	1,796,000	16
District of Columbia	2,000,000	3,700,000	17
Federal Trade Commission	1,600,000	1,500,000	17
Department of Commerce	1,212,400	911,300	17-18
Civil Service Commission	426,000	387,000	18
President's Comm. for Employment of the Physically Handicapped	214,700	182,575	18
Small Business Administration	150,000	70,000	18
Department of the Interior	140,000	154,950	19
National Advisory Committee to Selective Service	19,000	19,000	19
Office of the Attending Physician of Congress	13,145	12,145	19
Totals	$2,886,260,831	$2,541,483,506	

* The figure for fiscal 1958 is the appropriations of the Federal Civil Defense Administration and the Office of Defense Mobilization; now combined in the Office of Civil and Defense Mobilization.

While nearly 38 million people are eligible to receive all or part of their medical care from or through the federal government, medical care represents only a part of the total spent by the U. S. in medical fields. Many millions of dollars go for research, drug control, personnel training and other efforts not directly related to the rendition of medical care.

As in last year's report, we have listed in table form payments to disabled persons through programs which the federal government finances entirely or in part. Such beneficiaries now total nearly 6,000,000, a 15% increase over last year. Money paid them has increased to 4.75 billion dollars, over 40% more than last year. These data are on the last page, separated from the rest of the report because not all of the money is federal.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE (This Year: $1,116,207,896—Last Year $849,395,800)

Division of Hospital Facilities....................$187,800,000
last year: $122,650,000

This division administers the federal aspects of both the original and expanded Hill-Burton programs. In 1958 Congress enacted legislation which authorizes loans in lieu of grants for any of the eligible projects under the entire program. Since 1946 the federal contribution through June 30, 1958, amounts to $1,024,000,000; when the sponsors' share is included, the total is $3,323,000,000 (these figures are for both the original and the expanded program). This is the first time since fiscal 1950 that the appropriation has reached $150,000,000 for the original program plus the categorical programs. Total appropriations are divided into the following four categories:

Hill-Burton Original Program....................$150,000,000
last year: $ 99,000,000

This appropriation, allotted to the states on the basis of population and per capita income, assists in the financing of new hospitals and related health facilities construction under the original Hill-Burton program. To June 30, 1958, federal funds have partially financed approximately 3,476 projects, including 159,745 hospital beds, 768 public health centers, 23 state health laboratories and something in excess of 100 nurses' homes and training facilities.

Medical Facilities—Category Program....................$35,000,000
last year: $21,000,000

The total allotted to the state this year on a population-per capita-income formula will assist in the financing of new construction under the 1954 amendments in four categories as follows: $7,500,000 for hospitals for the chronically ill and impaired; $7,500,000 for diagnostic centers, or diagnostic and treatment centers; $10,000,000 for nursing homes; and $10,000,000 for rehabilitation facilities. As under the original program, the federal share may range from one-third to two-thirds of the total project cost. As of June 30, 1958, a total of 496 projects had been approved, divided among the four categories as follows: facilities for chronically ill (98), diagnostic-treatment centers (196), nursing homes (125), and rehabilitation facilities (82).

Hill-Burton Administrative Expenses....................$1,600,000
last year: $1,450,000

This appropriation is used for administration, including salaries and expenses for the hospital survey and construction program for the federal headquarters and for eight regional federal offices.

Research $1,200,000
last year: $1,200,000

Authorized in 1949 but not appropriated until 1955 is this item for research, experiments and demonstrations on utilization of hospital services, facilities and resources. The bulk of the money is assigned as grants to states, universities, hospitals, hospital associations, professional associations, and community organizations and a small amount for direct research by U. S. Public Health Service.

National Institutes of Health....................$324,383,000
last year: $241,183,000

National Cancer Institute....................$75,268,000
last year: $56,402,000

About 50% of this appropriation is earmarked for grants to non-federal individual investigators and private institution for research and training. Almost 25% will be used to support contracts with the pharmaceutical and chemical industries in research on chemotherapeutic agents for the treatment of cancer. The states receive $2,250,000 for cancer

---

This report was prepared by the Washington Office of the American Medical Association.

control work. $4,212,000 will provide professional and technical assistance to public and private institutions engaged in prevention, diagnosis, and treatment among individuals and large population groups (cytology activities) and environmental cancer activities. The balance is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda (Md.) Clinical Center and related auxiliary services.

National Heart Institute..$45,613,000
last year: $35,936,000

Grants to non-federal individual investigators and public and private institutions for research and training take about 75% of the appropriation. $2,125,000 is allocated to states for heart disease control. The balance is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda (Md.) Clinical Center and related auxiliary services.

Mental Health Institute..$52,419,000
last year: $39,217,000

Approximately 75% of this appropriation is apportioned for research and training through grants to individual investigators and public and private institutions. The sum of $4,000,000 is allocated to the states for community mental health services. The remainder is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Arthritis & Metabolic Diseases Institute...............$31,215,000
last year: $20,385,000

Grants to public and private investigators for research and training total 75% of this appropriation. The balance is for direct research operations, including salaries, supplies and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Neurological Diseases & Blindness Institute..........$29,403,000
last year: $21,387,000

Grants to public and private investigators and institutions for research and training total 80% of this appropriation. The remainder is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Allergy & Infectious Diseases Institute.................$24,071,000
last year: $17,400,000

Research grants to public and private investigators for research and training amount to 70% of this appropriation. The remainder is for direct research operations, including salaries, supplies and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Dental Health Institute..$7,420,000
last year: $6,430,000

Grants to public and private investigators for research and training total about 60% of this appropriation. $983,000 will be used for technical assistance to states and $320,000 for coordination and development of dental resources. The remainder is for direct research at Bethesda, review and approval of grants, administrative expenses, and for support of the Clinical Center.

National Institutes of Health—General Funds......$28,974,000
last year: $14,026,000

These funds are administered by the Division of General Medical Science of the National Institutes of Health, with practically all funds being expended for research and training grants, with the exception of $2,236,000 for control of biologics (including polio and flu vaccine), which activity is under the Division of Biologics Standards. The balance goes toward supporting fellowships and administrative expenses relating to grants.

Laboratory Research Construction (NIH)...........$30,000,000
last year: $30,000,000

There is available for planning and construction of research facilities $30,000,000 the authority for which is Public Law 835 (84th Cong.). To be eligible for grants, the applicant must be a public or nonprofit institution determined by the Surgeon General, after consultation with the National Advisory Council on Health Research Facilities, to be competent to engage in the type of research for which the facility is to be constructed. This is the third year of this program's operation.

Water Pollution Control..$45,000,000
last year: $47,500,000

Under Public Law 660, enacted in 1956, the Federal Government makes grants for the construction of waste treatment plants. Although $45,000,000 was appropriated for fiscal 1959, the funds allocated to the states will be based on the $50,000,000 authorized in the basic legislation.

Hospitals and Medical Care.................................$48,454,000
last year: $44,399,000

These funds are used for operational costs and maintenance of PHS hospitals and health services in caring for American seamen, Coast Guard and Public Health Service personnel and their dependents, federal employees injured at work, leprosy patients and narcotic addicts, and includes studies in the development and coordination of nursing resources. It also includes $1,000,000 for payments to Hawaii for care of patients suffering from leprosy and $5,800,000 for nurse training grants. Not shown in the appropriation is approximately $4,500,000 additional income, principally from other federal agencies for reimbursable services.

Indian Health Activities..$44,597,000
last year: $43,230,300

Under Public Law 568 (83rd Cong.), PHS assumed responsibility for the health of American Indians and natives of Alaska which formerly was a function of Interior Department. The total is broken down as follows: hospital care in Indian hospitals, $23,756,000; contract patient care, $8,000,000; field health services $6,620,000; program direction and management services, $2,097,000; and modernization of hospitals and construction of facilities $4,124,000. In addition, the Indian health activities of PHS will receive approximately $740,000 as reimbursements from other governmental agencies for services rendered in PHS facilities.

Assistance to States—General................................$22,889,000
last year: $22,592,000

Grants totaling $15,000,000 will be available for allocation to the states in support of state and local general public health activities. These grants must be matched one state dollar for every two federal dollars. U. S. Public Health Service will spend $5,889,000 to provide technical assistance, consulting services to states, expenses of the National Office of Vital Statistics, international health activities, demonstrations, training activities, and operational expenses. A total of $2,000,000 will be available for grants to schools or direct traineeship awards to individuals for the training of professional public health personnel.

Sanitary Engineering Activities............................$12,815,000
last year: $12,640,000

This program is made up of seven activities as follows: air pollution control, $3,860,000; water supply and water pollution control, $6,600,000; radiological health activities, $608,000; milk and food sanitation activities, $492,000; interstate carrier and general sanitation activities, $510,000; Sanitary Engineering Center research activities, $440,000; and administration, $305,000.

Tuberculosis Control...$6,386,000
last year: $7,000,000

Grants to states for diagnostic and treatment clinics, mass case-finding and follow-up services account for $4,000,000, all of which has to be matched equally by the states. The remainder is for direct operations of PHS.

Communicable Disease Activities............................$8,300,000
last year: $6,250,000

The entire appropriation is used for direct activities of the PHS Communicable Disease Center at Atlanta, Ga., and its affiliated operations. The Center carries on studies in epidemiology, furnishes laboratory diagnostic services and sponsors special projects to assist states. This amount includes $1,700,000 for equipment for the new Communicable Disease Center which is now under construction in Atlanta.

Office of the Surgeon General..................................$5,260,000
last year: $5,100,000

For administrative expenses of this office, including all housekeeping services, evaluation of public health needs, and personnel training. Included also is approximately $1,389,400 for administration of the National Health Survey Act authorized by Public Law 652 (84th Cong.).

Venereal Disease Control...$5,400,000
last year: $4,415,000

Of the total, $2,400,000 goes for direct grants to states for venereal disease detection, treatment and control on a special-need basis. Most of the remainder is spent for technical assistance to the states, including funds to pay 258 federal employees, the majority of whom are assigned to state health departments.

Foreign Quarantine Service...................................$4,108,000
last year: $3,876,000

This service operates 310 medical quarantine stations on borders of the United States. It also operates 28 medical examination stations on foreign soil for the examination of aliens seeking visas to enter the U. S. Inspections are made of all seagoing vessels and aircraft entering the U. S. It is estimated that the service will examine more than 3,100,000 aliens in this country and 210,000 abroad.

Alaska Health and Sanitation Programs..................$8,665,000
last year: $2,165,000

This appropriation will be divided as follows: $638,000 for grants to Alaska for public health services; $527,000 for research activities of the Arctic Health Research Center at Anchorage; $1,000,000 to enable Alaska to pay for hospitalization for Alaska's mentally ill at Morningside Hospital in Portland, Oregon; and $6,500,000 for construction of mental health facilities in Alaska as authorized by the Alaska Mental Health Act.

National Library of Medicine.................................$8,365,000
last year: $1,450,000

As a result of Public Law 941 enacted in 1956, the Armed Forces Medical Library was renamed the National Library of Medicine and transferred to the Department of Health, Education, and Welfare. A new structure has been authorized to house the Library and $6,950,000 in construction funds was appropriated for 1959. The new Library will be built on the southeast corner of the NIH reservation at Bethesda.

Reimbursable Health Programs for Other
Governmental Agencies..$487,000
last year: $475,000

This represents the cost of services expected to be advanced to Public Health Service by other governmental agencies for establishing and operating on-the-job clinics. PHS deals largely with Washington personnel, whereas 90% of the total number of government's employees are located outside the greater Washington area.

Freedmen's Hospital..$2,975,000
last year: $3,000,000

This institution with an average patient load of 328, plus 32 new-borns, is a medical teaching facility and general hospital. Its patients are chiefly medical indigents from the District of Columbia and the adjoining area. The hospital is utilized for training of interns and residents, chiefly from Howard University, and it has a nurses' training school. A total of $4,267,000 is authorized for operating costs. All in excess of $2,975,000 (appropriated for fiscal 1959) are expected reimbursements from charges made to patients and payments made by the District of Columbia and other federal agencies and from the counties surrounding Washington who utilize these facilities for welfare patients. Some supervisory functions over this program is vested in PHS.

Howard University...$1,022,000
last year: $1,136,000

This University came into being shortly after the close of the Civil War because of the lack of higher educational facilities for negroes. It is jointly supported by congressional appropriations and private funds and offers instruction in ten schools and colleges, including colleges of medicine, dentistry, and pharmacy. This year the University's total operational budget is in excess of $8,000,000. Of this amount, the Federal Government will contribute $4,350,300 toward operational expenses, $123,000 for plans for construction, and $163,000 for completion of a men's dormitory. The combined budgets for the colleges of medicine, dentistry, and pharmacy will require approximately 24% of the University's total budget. The entire student body of the University for 1958-59 will be approximately 5,500. There are 350 students enrolled in the college of medicine, 289 in the college of dentistry and 133 in the college of pharmacy. The federal contribution for direct current operations in the colleges of medicine, dentistry, and pharmacy total approximately $1,022,000, according to the University's treasurer.

St. Elizabeths Hospital...$17,082,000
last year: $15,904,500

St. Elizabeths provides treatment for several classes of mentally ill persons, including those residing in the District of Columbia, beneficiaries of the Veterans' Administration, beneficiaries of Public Health Service, insane persons charged with or convicted of crimes in U. S. courts (including the Court of the District of Columbia), certain American citizens found insane in Canada, the Panama Canal Zone and the Virgin Islands, certain foreign service personnel, and members of the military services admitted to the hospital prior to July 16, 1946. Congress appropriated $3,186,000 to this institution for operational expenses $87,000 for major repairs, and $125,000 for construction planning. Reimbursements from other agencies will approximate $13,684,000. This hospital has an average daily patient load of 7,000.

Bureau of Public Assistance (Medical
Payments) $240,000,000
last year: $150,000,000

Out of a total budget of approximately $3.2 billion (federal and state) for categorical public assistance programs, officials of the Social Security Administration estimate that approximately 12.8% is now being devoted to health care of recipients. For all facets of living expenses and medical care, the total federal contribution this year will be about $1.9 billion. An estimated $410 million of federal, state, and local funds are expected to be paid for medical and health needs of categorical assistance recipients this fiscal year. About $330 million will be paid to vendors of medical care, such as physicians, hospitals, pharmacists, nursing homes, etc., and about $80 million directly to recipients to enable them to meet their medical care needs. The federal share of combined medical payments to vendors and to recipients will be about $240 million.

Office of Vocational Rehabilitation.......................$57,800,000
last year: $50,830,000

Under the expanded Vocational Rehabilitation Act (Public Law 565, 83rd Cong.), Congress this year appropriated $56,400,000 for grants to states and other agencies. This is divided as follows: (a) support of basic rehabilitation services, including medical examinations, surgical and therapeutic treatment, hospitalization, prostheses, occupational tools and aids, vending stands, rehabilitation facilities, vocational training and funds for maintenance (based on per capital income and population as in Hill-Burton), $45,500,000; (b) extension and improvement of state programs, $1,500,000; (c) special grants to states or nonprofit organizations for projects designed to expand the rehabilitation program (2-1 federal-state matching), $4,600,000; (d) $4,800,000 for training of rehabilitation personnel, including physicians, therapists, psychologists, counselors, medical and psychiatric social workers. In addition $1,400,000 is available for federal administrative costs.

Children's Bureau $32,300,000
last year: $32,300,000

Operating under the Social Security Administration, the Children's Bureau administers grants to states for maternal and child health, and crippled children's and child welfare services. This year grant money totals $43,500,000 divided as follows: $16,500,000 for maternal and child health work; $15,000,000 for crippled children's services; and $12,000,000 for child welfare services. However, this last item has no medical significance and, therefore, it is not reflected in the total of $32,300,000. One-half of the federal funds for maternal and child health and crippled children's services is required to be matched dollar for dollar by the states. In addition the Children's Bureau has $2,000,000 to finance investigating and reporting activities and to administer all the grants. About 40% of this amount is chargeable to the health and related activities of the Children's Bureau which include administration of grants for maternal and child health and crippled children's services and consultative services to state agencies and other public and voluntary agencies and organizations engaged in the provision of maternal and child health services.

Federal Surplus Property
Donation Program...............................Approx. $18,319,806
last year: $15,200,000

The Department of HEW has authority to make donations of personal property and transfer of real estate declared surplus by federal agencies for health needs. In the case of real estate, conditional title is vested in the transferee and then after a number of years of utilization of the property in accordance with imposed conditions the property can become absolutely vested. Recipients of personal property may be medical institutions, health centers, hospitals and clinics. Eligible donees of real property may be any institutions organized for health purposes, including those engaging in medical research. It is difficult to determine the exact value of property donated and transferred since accounting is on the basis of acquisition cost. Last year approximately $60,910,000 of personal property (acquisition value) was allocated for health purposes which probably had a fair market value of roughly $18,000,000. During the same period, approximately $1,229,582 of real estate (acquisition value) was transferred with a fair market value of $319,806. It is expected that the level of donations and transfers for the current fiscal year will be in line or slightly in excess of last year's totals.

Food and Drug Administration..............................$9,800,000
last year: $9,300,000

For administering the Food, Drug and Cosmetic Act, Congress voted the above funds. FDA will also realize an estimated $1,410,000 from fees paid by industry for certification of antibiotics, insulin, etc.

U. S. Office of Education..$4,000,000
last year: $4,000,000

For a number of years the Office of Education has been making grants to states chiefly for vocational education. During the last fiscal year approximately $4,000,000 was made available as grants to aid the states in the training of practical nurses. For this year, the Office of Education has available approximately $34,000,000 for grants to states, of which $4,000,000 is again earmarked for the practical nurse training program.

VETERANS ADMINISTRATION

(This Year: $843,524,000–Last Year: $849,374,000)

In-Patient Care in VA Hospitals*.....................$675,298,000
last year: $657,071,000

VA's largest single medical expenditure covers in-patient care in 173 VA hospitals and provides for an estimated 120,954 beds. At present VA reports an estimated daily patient load of 111,063, approximately 92% of bed capacity. The appropriation includes salaries of physicians and other personnel, medical rehabilitation of veterans, dietetic and nursing services, social services and special services, such as recreation and transportation of veterans.

Out-Patient Care* $75,399,000
last year: $79,000,000

The bulk of this appropriation is for out-patient care in about 100 VA clinics. The remainder is earmarked for fees to physicians ($8,079,000) and dentists ($1,048,000) under the home-town care program.

Modernization and Replacement Construction*....$16,595,000
last year: $42,500,000

This amount is for work on existing units where costs exceed $300,000 per project and equipment for new units. The money is available until expended. (See Alterations and Improvements item on this page for small projects.)

Domiciliary Care*..$31,812,000
last year: $31,490,000

Domiciliary care is being provided in 17 VA facilities for about 16,810 veterans who, while incapacitated for employment, are not in need of full hospital care. VA also makes payments to 33 state veterans homes with a daily patient load of approximately 9,500. Payments this fiscal year are estimated at $6,440,000. Under Public Law 613 (83rd Congress) federal contributions to these homes were raised from a maximum of $500 to $700 a year per patient.

Contract Hospitalization*.....................................$13,557,000
last year: $13,389,000

This appropriation finances an average daily patient load of 3,117 veterans in federal hospitals other than VA and in state and municipal hospitals. Patients in federal non-VA hospitals are estimated at 1,324 and in non-federal hospitals, 1,676. Mental cases make up the largest single category of contract cases.

Medical Administration*..$7,175,000
last year: $7,862,000

To operate the VA Department of Medicine and Surgery in the central office and the seven area medical offices; included are salaries, travel and like expenses.

Medical Research*................ ....$16,344,000
last year: $11,344,000

For research, mostly in VA hospitals. The breakdown: general medical and surgical research, $9,600,700; atomic medical research, $2,803,300; prosthetics testing, $1,000,000; neuropsychiatric, $1,659,100; tuberculosis, $1,130,900; other, $150,000.

Alterations, Improvements and Repairs*................$2,700,000
last year: $2,028,000

For alterations, improvements and repairs to VA clinics and domiciliaries (costing less than $300,000 per project).

Supply Depot Operations*.....................................$2,055,000
last year: $1,790,000

For maintaining and operating supply depots handling the purchase, shipping and storage of medical supplies and equipment used by the Department of Medicine and Surgery.

Medical Education and Training*..........................$1,339,000
last year: $1,400,000

For VA training programs for physicians and other VA personnel in medical specialties and auxiliary services.

---

*In appropriating for VA, Congress stipulated that the funds were predicated on furnishing care and treatment for 140,490 beneficiaries during this year. This total of beneficiaries was arrived at by adding the estimated number of veterans to be cared for in VA hospitals, domiciliary facilities, contract hospitals, and state veterans homes. There is no way of estimating whether more or fewer patients than this total will be cared for during the year. If VA doesn't furnish care at this level, its funds will be reduced proportionately.

Medical Care—Philippine Veterans........................$1,250,000
last year: $1,500,000

Until 1960 the U. S. will contribute for the medical care of Philippine veterans.

DEPARTMENT OF DEFENSE

(This Year: Approx. $751,115,000—Last Year: Approx. $702,305,000)

Army Medical Services*......................Approx. $295,000,000
last year: $270,700,000

The estimated cost includes expenses normally associated with the operation of military hospitals and dispensaries, military and civilian salaries, medical supplies and equipment, utilities, communications, transportation travel subsistence, maintenance and repair of buildings and grounds, expenses for construction, dependent medical care, medical education and training, medical research and preventive medicine.

Air Force Medical Services*................Approx. $221,000,000
last year: $211,400,000

The estimated cost includes expenses normally associated with the operation of military hospitals and dispensaries, military and civilian salaries, medical supplies and equipment, utilities, communications, transportation travel subsistence, maintenance and repair of buildings and grounds, expenses for construction, dependent medical care, medical education and training, medical research and preventive medicine.

Naval Medical Services*......................Approx. $235,000,000
last year: $220,100,000

The estimated cost includes expenses normally associated with the operation of military hospitals and dispensaries, military and civilian salaries, medical supplies and equipment, utilities, communications, transportation travel subsistence, maintenance and repair of buildings and grounds, expenses for construction, dependent medical care, medical education and training, medical research and preventive medicine.

Office, Asst. Secretary of Defense
(Health & Medical)................................Approx. $115,000
last year: $105,000

For salaries, travel and administration of this office, and for travel expenses and consultant fees for the Defense Department Civilian Health and Medical Advisory Council.

The 85th Congress placed restrictions on the Dependents Medical Care Program (Medicare). Because of these changes, reliable program cost estimates cannot be made at this time.

ATOMIC ENERGY COMMISSION

(This Year: $45,462,000—Last Year: $40,085,000)

The Atomic Energy Commission's Division of Biology and Medicine has about $5.4 million more than last year for research projects. This year's total includes the following spending plans: cancer, $4,172,000; other medical, $12,268,000; biological, $14,104,000; biophysical, $1,784,000; development of new laboratory equipment, $2,498,000; vocational and special training, $2,220,000; radioisotope distribution, $310,000; environmental science, $5,394,000; and miscellaneous items, $2,712,000.

INTERNATIONAL COOPERATION ADMINISTRATION

(This Year: $39,600,000—Last Year: $37,300,000)

Technical Cooperation Health Programs.............$14,000,000
last year: $14,000,000

The International Cooperation Administration through cooperatively financed programs is helping 44 countries, at their request, to improve their health and living conditions. The broad range of health projects falls into the fields of: (1) epidemic and infectious disease (malaria, trachoma, smallpox, typhoid); (2) environmental sanitation (safe water systems and sewage disposal); (3) development of rural health services and facilities (health centers, hospitals, clinics, laboratories); (4) training of personnel both locally and in the United States; (5) the establishment and development of basic health training institutions (schools of nursing, schools of public health).

Malaria Eradication Program...............................$25,600,000
last year: $23,300,000

In the Mutual Security Act, the 85th Congress authorized U. S. participation in a world-wide malaria eradication program not to exceed the amount indicated above.

DEPARTMENT OF STATE

(This Year: $21,638,380—Last Year: $15,718,110)

United Nations Children's Fund............................$11,000,000
last year: $10,000,000

The United States' share of the Children's Fund is up about $1,000,000 over last year for a total of $11,000,000. The percentage of U. S. contribution to the total fund has dropped slightly from 55% to 52.5%. Other governments increased contributions from $8.2 million last year to $9.9 million this year. There are 81 contributing governments and territories. The fund is aiding 324 health and medical projects in 104 territories and benefiting 50 million children and others. More than 45,000,000 children and pregnant and nursing mothers benefited directly from the Fund last year. More than 14,000,000 children were vaccinated against tuberculosis, some 28,000,000 were protected with DDT against malaria, some 2,800,000 children and mothers were treated for yaws, bejel, or syphilis, 900,000 children were treated for tracoma.

World Health Organization...................................$7,424,380
last year: $4,200,110

This country's share of the WHO budget remains at about one-third of the total assessments of the 85 member governments. Last year WHO was sponsoring about 600 projects in 117 countries and territories. WHO's overall budget is broken down this way: approximately 88% for operating programs, 9% for administration, and the rest for organizational meetings. WHO actually had three appropriations from the U. S. The first is for $4,666,480 for its general activities; the second for $300,000 for research; and the third for $5,000,000 for malaria eradication which will come from ICA's $25,600,000. This organization also administers $5,462,000 obtained from the U. N. technical assistance program. Approximately $2,457,900 of this total comes from the U. S.

Pan American Sanitary Bureau...............................$1,914,000
last year: $1,518,000

The United States is contributing approximately two-thirds of the Bureau's regular budget which this calendar year totals $3,000,000. In addition, this country hopes to allocate $3,000,000 for 1959 malaria eradication programs which will come from ICA's $25,600,000 (see above). The Bureau, in existence many years before WHO was organized, is the regional office of WHO for the Americas. The Bureau is sponsoring health programs in 20 Latin American countries, dependent territories of European powers in this hemisphere, and the United States.

Health Program for Overseas Employees................$1,300,000
(new program)

The Department of State furnishes health care to 10,000 overseas employees and approximately 15,000 of their dependents. In the case of dependents, the government pays for medical care only after the first $35 of expense incurred for a single illness. In most cases, military medical facilities of our government overseas and facilities operated by the United States Public Health Service are utilized. However, in some cases private physicians and private hospitals are used.

---

*A Defense Department source gives this explanation: All dollar amounts are estimates and have been rounded because military appropriations are not broken down into categories of medical expenditures. The estimated increase during fiscal year 1959 in the total military medical programs (about $49 million higher than was estimated in October of 1957 for the fiscal year 1958) is primarily attributable to an increase in the cost of goods and services and because of an increase in salaries for military and civilian personnel, approved in the latter part of fiscal year 1958. It is estimated that the average daily patient load will approximate the same as for fiscal 1958 and that in the combined military services in-patient hospital care this year will cost about $319 million. Out-patient care, which will cost about $171 million because of an estimated 34,000,000 out-patient visits, excluding dental visits, reflects a small reduction in workload due to reduction in military population.

NATIONAL SCIENCE FOUNDATION

(This Year: $19,575,000–Last Year: $7,500,000)

The Foundation's overall budget of $130,000,000 is $90,000,000 above last year's appropriation. The sum of $19,575,000 is earmarked for research grants in the biological and medical sciences. The Foundation provides support for basic scientific research, for training and education in the sciences through fellowships and programs to improve science teaching, and programs to improve exchange of scientific information.

OFFICE OF CIVIL AND DEFENSE MOBILIZATION

(This Year: $13,617,000–Last Year: $3,177,000)

Under Reorganization Plan No. 1 of 1958, the Federal Civil Defense Administration and the Office of Defense Mobilization were consolidated into what is now the Office of Civil and Defense Mobilization. The total budget for this new agency is $45,285,000. The health and medical activities will expend $13,617,000 broken down as follows: salaries and expenses, $403,000; research $179,000; education (medical education for national defense), $135,000; federal medical stockpiling, $12,400,000; federal matching contributions re medical equipment for state agencies, $500,000.

FEDERAL EMPLOYEES HEALTH PROGRAMS

(This Year: $11,000,000–Last Year: $10,000,000)

Another health program, this one available to all federal civilian workers, provides limited services through health clinics. They are operated by federal agencies which employ 300 or more persons in any one area. By regulation, maximum cost of a health service cannot exceed $13 a year per employee, although special industrial conditions or minimal size units may warrant a higher ceiling. Services include treatment for on-the-job illness and physical examinations for employment.

DEPARTMENT OF LABOR

(This Year: $8,827,000–Last Year: $8,069,476)

Bureau of Employees' Compensation......................$8,200,000
last year: $7,500,000

An estimated 2,337,000 federal workers are eligible under the Federal Employees' Compensation Act for medical and hospital care, rehabilitation services, disability and death payments, funeral and burial expenses. For treatment of employees by private doctors and hospitalization in private facilities, the Labor Department has set aside $6,200,000 this fiscal year, and for similar services in federal hospitals and clinics, $2,000,000. Expenditures for care by non-governmental physicians and in private hospitals has been increased by $545,000 over last year's spending level.

Bureau of Labor Standards.......................................$627,000
last year: $569,476

For promotion of industrial safety, the Bureau plans to spend $412,300, and for re-employment programs of the physically handicapped, $214,700. The agency develops standards for hazardous occupations, assists the states in accident prevention programs and assist states and unions in training safety personnel.

PANAMA CANAL COMPANY AND PANAMA CANAL ZONE GOVERNMENT

(This Year: $3,959,900–Last Year: $5,988,300)

Expenditures for fiscal 1959 for operation of Canal Zone hospitals and clinics is estimated at $6,343,800. Medical services are available to Zone employees and their dependents, certain military and other persons. Some of these patients make payments toward the cost of their medical care, which payments are returned to the United States Treasury. In 1959 such revenue is estimated at $3,266,200. When last year's report was compiled, the revenue figure was not obtainable. Expenditures for operating public health activities, including sanitation, health director's office, Division of Veterinary Medicine, preventive medicine and quarantine and general government expense applicable to the Health Bureau, should total $882,300. The four hospitals operated by the Health Bureau of the Canal Zone Government contain 1008 beds as follows: Gorgas Hospital (440), Coco Solo Hospital (148), Corozal (300), Palo Seco Leprosarium (120). In addition there are two dental clinics, one medical clinic and five first-aid stations.

DEPARTMENT OF TREASURY

(This Year: $3,854,500–Last Year: $3,837,850)

The Bureau of Narcotics, operating within the Treasury Department, is primarily engaged in investigation, detection and prevention of violations of the federal narcotic and marihuana laws. Subsidiary functions are: (1) exercising control over the legitimate manufacture and distribution of narcotics within the United States through a quota-system and supervision over approximately 302,000 qualified registrants (physicians, pharmacists, dentists, wholesalers, etc.); and (2) training of narcotics law enforcement officers sponsored by local and state law enforcement agencies. Increased emphasis is being placed on drying up interstate and international sources of illicit supplies.

DEPARTMENT OF JUSTICE

(This Year: $2,105,000–Last Year: $1,796,000)

The figure represents the Bureau of Prisons' estimate of the cost of medical and dental services for approximately 22,000 prisoners in 30 federal penal institutions. The bulk (about $2,000,000) goes to commissioned officers of the Public Health Service assigned to the prisons and to related civil service personnel for services that include psychiatric, medical, surgical, nursing and dental treatment. Another approximately $105,000 is earmarked for fees to 220 consultants in various medical specialties.

DISTRICT OF COLUMBIA

(This Year: $2,000,000–Last Year: $3,700,000)

Only a rough estimation can be made of the federal contribution for health and medical programs of the District of Columbia. The total District budget for all governmental functions is in the neighborhood of $204,000,000. Congress has appropriated $20,000,000 for this year toward the cost of the District government or about one-tenth of the total. The District Health Department will expend $32,605,000. In this amount is included approximately $12,498,000 for care of the District's insane in St. Elizabeths Hospital. Since such sum is shown in this report under St. Elizabeths Hospital, it may be deducted from the District's appropriation for public health, leaving a net balance of $20,107,000 in that category. Since the federal contribution to the District budget represents only one-tenth, then the federal contribution attributable to health and medical activities can be approximated at $2,000,000.

FEDERAL TRADE COMMISSION

(This Year: $1,600,000–Last Year: $1,500,000)

The Commission plans to spend about the same as last year for research, testing and compliance operations in the field of food, drugs, cosmetics and devices. This is nearly 20% of the agency's total budget of $5,975,000. FTC is charged by Congress with the safeguarding of life and health of the public through the prevention of the dissemination of false advertisements of various products.

DEPARTMENT OF COMMERCE

(This Year: $1,212,400–Last Year: $911,300)

Civil Aeronautics Administration...............................$600,000
last year: $385,000

Spending for the Civil Aeronautics Administration flight safety program is divided as follows: $375,000 for salaries and administrative expenses at headquarters; $170,000 for similar expenses in regional offices; $55,000 for the CAA Medical Research Laboratory at Oklahoma City. Five full-time and four part-time medical officers in the field supervise the periodic physical examinations required of commercial and private pilots. CAA has 1,826 designated medical examiners in the United States and overseas. A total of 225,614 examinations were made last year and a similar number are expected to be made this year. For this service, pilots pay examining physicians directly.

National Bureau of Standards..................................$612,400
last year: $526,300

The Bureau of Standards performs tests and engages in developmental research on its own initiative and at the request of others. The Bureau will expend $176,800 of its own money this year as follows: $117,200 for radiation research; $43,000 for audiometric calibrations research; $16,600 for dental materials research. In addition the Bureau will receive $435,600 from other agencies, divided as follows: $71,100 for radiation research; $91,000 for air pollution research; $49,000 for instrument testing; $63,500 for anesthesiological and respiratory equipment evaluation; $93,000 for dental materials research; and $68,000 for preparation of C-14 labeled carbohydrates.

CIVIL SERVICE COMMISSION

(This Year: $426,000–Last Year: $387,000)

The Commission's total budget is approximately $18,200,000, out of which about 2.3% goes to the medical division for salaries of eight physicians in Washington and eleven in the regional offices. The medical division's duties include establishing and reviewing physical standards for all civilian jobs in the Federal Government, supervising and adjudicating disability claims for retirement, and setting professional standards of doctors and ancillary personnel to be employed in government in the competitive civil service.

PRESIDENT'S COMMITTEE FOR EMPLOYMENT OF PHYSICALLY HANDICAPPED

(This Year: $214,700–Last Year: $182,575)

Projected spending is for salaries and administration in the development and promotion of educational programs among employers and the general public to stimulate employment of qualified physically handicapped persons. It also entails expenses in connection with the National Employ the Physically Handicapped Week.

SMALL BUSINESS ADMINISTRATION

(This Year: $150,000–Last Year: $70,000)

The Small Business Administration provides financial assistance to hospitals, convalescent and nursing homes, medical and dental laboratories, and physicians for expenses, improvements and general operations. Small Business Administration loans are of two types: participation loans, those made jointly with banks and other private lending institutions; and direct loans, where no participation is available. Since all loans must be of such sound value or so secured as reasonably to assure repayments, no program losses are anticipated. SBA officials estimate that administrative expenses for the headquarters and field offices will approximate $150,000, which is about 1.5% of the total administrative fund available for all lending operations.

DEPARTMENT OF THE INTERIOR

(This Year: $140,000–Last Year: $154,950)

The Bureau of Mines, operating within the Department of the Interior, has a total appropriation of $5,585,000 for health and safety activities for this fiscal year. Identifiable health programs and expenditures are as follows: $41,000 for a program for silicosis prevention in mines; and $99,000 for studies on natural and equipment fuel gases in mines and effect of radioactivity in metal mines.

NATIONAL ADVISORY COMMITTEE TO SELECTIVE SERVICE

(This Year: $19,000–Last Year: $19,000)

In requesting this budget, which is the same as last year's appropriation, the National Advisory Committee to Selective Service was informed by the military it probably would not be necessary to make draft calls for physicians in the current fiscal year. In any event, if calls were necessary, they would be less than the level which obtained when state and territorial offices and staffs were in operation. Congress provided the $19,000 appropriation for a skeleton staff and for expenses of national advisory committee operations, plus nominal expenses of state committees which are now on a standby basis. Because it now appears that several hundred physicians will have to be called before next June 30 via the draft, additional funds will be requested when Congress convenes in 1959. The National Advisory Committee has the responsibility of advising Selective Service on deferment policies for physicians in residencies, teaching positions, essential laboratory and clinical research and re persons deemed necessary to protect civilian health at a time when draft calls are being made. The state and territorial committees assist the national committee when their services are required.

OFFICE OF THE ATTENDING PHYSICIAN OF CONGRESS

(This Year: $13,145–Last Year: $12,145)

Since 1928, the Office of the Attending Physician of Congress has provided outpatient care for members of the House and Senate and their staffs. By an act of that year, the office has been filled by a medical officer of the United States Navy. Sole occupant of the post has been Rear Admiral George W. Calver (M. C.), U. S. N. Funds voted by Congress are for medical supplies and equipment and contingent expenses. Salaries of Dr. Calver, his assisting physicians and enlisted corpsmen are paid from Navy funds.

TABLE 2.—*Payments to Individuals Because of Disability Through Programs in Which the U. S. Government Participates (fiscal year ending June 30, 1959)*

(Small groups of federal retirees' plans not listed; administrative cost of program omitted)

Programs	Estimated Beneficiaries	Approx. Payments
Veterans Benefits		
A. Service-Connected Disability..........	2,445,000[a]	$2,013,000,000[a]
B. Non-Service-Connected Disabilities....	1,332,000[b]	1,135,000,000[b]
Military Retirement Permanent & Temporary Disability....................	82,600	221,840,000
Federal Employees Compensation (Payments)	136,500	24,835,000
(These programs fully financed by U. S.)		
Public Assistance		
A. Aid to Needy Permanently & Totally Disabled......................	336,000	260,200,000[c]
B. Dependent Children Aid (incapacitated father segment)......	722,000[d]	235,000,000[d]
C. Aid to the Blind.........................	108,800	90,400,000[e]
Disability Annuity Payments to Civil Service Retirees.....................	90,000[f]	127,000,000
(Public Assistance financed 55% U. S. & 45% states; Civil Service financed 50% U. S. & 50% employees.)		
Social Security—OASI Disability		
A. Disability Over Age 50................	262,000[g]	333,000,000
B. Childhood Disability Benefits[h]........	52,000[h]	24,000,000
C. Dependents of Disabled Workers[i]....	80,000[i]	50,000,000
(These programs financed by OASI Payroll Tax)		
Railroad Retirement Disability		
A. Permanent Disability for Regular Job	30,000	42,000,000
B. Permanent Disability for All Employment......................	71,000	88,000,000
C. Temporary Disability..................	150,000	50,000,000
(These programs financed 50% employers—50% employees.)		
Total......................................	5,897,900[j]	$4,694,275,000

[a] 388,000 dependents in this total; program decreasing as beneficiaries die.

[b] 511,000 dependents in this total; program is increasing rapidly.

[c] $143.9 million of this total is provided from U. S. funds. Additional program administrative cost is about $29.8 million (11.5%); U. S. *share is $14.9 million.*

[d] Provided to 167,000 families. $142.8 million of benefits is federal. Additional administrative cost is $22.8 million (9.7%); U. S. share is $11.4 million.

[e] U. S. contribution to program is $45.4 million. Additional administrative cost is $6.6 million (7.3%); U. S. share is $3.3 million.

[f] Number of persons in this program increased by 11,400 over last year.

[g] 262,000 beneficiaries are estimated at mid-year; by July 1, 1959 estimate is 330,000.

[h] Eligibility based on disability incurred before age 18; the 52,000 beneficiaries listed is at mid-year; by July 1, 1959 total will reach 73,000.

[i] Does not include any childhood disability beneficiaries entitled to benefits as dependents of disabled workers; the 80,000 beneficiaries listed is at mid-year; by July 1, 1959 total will reach 134,000.

[j] No adjustment made for payments to one individual through more than one program.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

Fifty-Eighth Annual Report on Medical Education in the United States and Canada by the Council on Medical Education and Hospitals of the American Medical Association

Edward L. Turner, M.D., Walter S. Wiggins, M.D., Glen R. Shepherd, M.D., John Hinman, M.D., and Anne Tipner

Table of Contents

Page
Acknowledgement 1460
Fifteen Years of Growth 1460
Progress and Experimentation in Medical Education 1461
Major Developments of Interest 1461
Historical Note on the Curriculum 1461
Duke University Initiates New Program 1461
Resume of First Year of Joint Study of the University of Buffalo Schools of Medicine and Education 1461
University of Washington Faculty Teaching Conference 1466
Review of 30-Year Experiment with Preceptorships at the University of Wisconsin 1466
Western Reserve Reports on First Evaluation Studies 1467
Introductory Studies in the Sociology of Medical Education 1467
Pittsburgh Outlines Plan of Experimental Program 1467
Annual Teaching Institute of Association of American Medical Colleges 1468
Focus on Future Needs in Medical Education 1468
Challenges to Medical Education 1468
Council on Medical Education and Hospitals Supports Development of Additional Facilities for Basic Medical Education 1470
Function and Structure of a Modern School of Basic Medical Sciences 1470
Reports of Current Interest to Medical Education 1471
Cooperation in Medical Education 1471
Collaboration with the Association of American Medical Colleges 1471
Financing Medical Education 1472
The Carroll Studies on Costs of Medical Education 1472
American Medical Education Foundation 1475
National Fund for Medical Education 1476
Studies on the Internship and Residency Aspects of Medical Education 1476
National Academy of Sciences-National Research Council Study: Postdoctoral Education in the Medical Sciences and Research; A Preliminary Report 1478
Report of the Secretary's Consultants on the Advancement of Medical Research and Education through the Department of Health, Education, and Welfare 1483
Progress Report Submitted by Committee on Preparation for General Practice 1484
Second World Conference on Medical Education 1485
Initial Test of Cooperative Analysis of Problems of Mutual Concern Leads to Proposal for Permanent Liaison Between Higher Education and Organized Medicine 1486
Page
Regional Interstate Compacts and Medical Education 1486
Southern Regional Education Board (SREB) and Medical Education 1487
Western Interstate Commission for Higher Education 1487
The New England Medical-Dental Education Program 1488
The National Society for Medical Research 1489
Medical Schools 1489
Approved and Newly Developing Medical Schools 1489
Construction of Facilities 1492
Medical School Expenditures 1493
Full-Time Faculty Positions in the United States Unfilled 1957-1958 1494
Graduate Education in the Basic Medical Sciences 1495
Teaching Responsibilities for Other than Medical Schools 1499
Supply of Anatomical Material 1502
Supply of Animal Material 1503
Medical Students 1503
Enrollments 1503
Enrollment of Women Students 1505
Geographic Source of Entering Students 1507
Attrition and Geographic Residence Restrictions 1511
College Record of First Year Medical Class 1512
Preprofessional Attainments of the Entering Class 1514
Medical Students Admitted to Advanced Standing 1515
Part-Time or Special Students 1515
Students Withdrawing for Advanced Study 1516
Attrition of Medical Students 1517
Student Expenses 1517
Scholarship and Loan Funds 1518
Student Employment Practices 1521
Graduates 1521
The Next Entering Class 1522
International Educational Exchange in Medicine 1522
Foreign Scholars Serving on United States Faculties 1522
Foreign Students (excluding Canadians) Enrolled in United States Medical Schools 1523
Foreign Physicians Training in United States Hospitals 1523
United States Faculty Members Abroad 1523
United States Students Studying Medicine Abroad 1523
Page
The Educational Council for Foreign Medical Graduates 1524
Postgraduate Medical Education 1524
Educational Values of the Grants and Training Awards Programs of the United States Public Health Service 1525
Research Fellowships 1526
Visiting Scientist Program 1526
Training Grants 1526
Traineeships 1527
Research Grants 1527
Health Research Facilities 1528
Training for Public Health Service Careers 1528
Conferences and Seminars 1528
The National Science Foundation 1529
Basic Research 1529
Short-Term Medical Research 1529
Conferences and Symposia 1530
Fellowships 1530
Contributions of the Office of Vocational Rehabilitation to Medical Education and Research 1530
Undergraduate and Graduate Medical Training Programs in the Veterans Administration 1531
Undergraduate Medical Education 1532
Graduate Training Program 1532
Foreign Medical School Graduates 1532
Resident Compensation 1533
National Defense and Medical Education 1533
Selective Service System 1533
Status of Medical Students 1533
Status of Interns and Residents 1534
Status of Faculty Members 1534
New Legislation 1535
Army, Navy, and Air Force Procurement Programs 1536
Army 1536
Navy 1537
Air Force 1541
Medical Education for National Defense 1542
Areas Allied to Medicine 1543
Schools for Medical Record Librarians 1543
Schools for Medical Record Technicians 1544
Schools for Medical Technologists 1544
Schools for Occupational Therapists 1545
Schools for Physical Therapists 1546
Schools for X-ray Technicians 1546
Editorials
The Purpose of a Medical School 1548
The Full-Time Faculty Deficit 1548
Balances to be Considered in International Education Exchange of Medical Students 1549

ACKNOWLEDGMENT

The material presented in the following pages constitutes the 58th Annual Report on Medical Education in the United States and Canada, compiled by the Council on Medical Education and Hospitals of the American Medical Association. This report is concerned specifically with basic medical education, certain facets of graduate education beyond medical school, postgraduate medical education, and education and training in areas allied to medicine which have requested Council cooperation and participation. Detailed information regarding postgraduate medical education is presented annually in a separate issue of The Journal (Aug. 16, 1958). Graduate medical education including internships, residencies, fellowships, and certain pertinent data regarding the specialty boards is revised annually and has been published in the Oct. 4, 1958, issue of The Journal.

Table 1.—*New Four-Year Medical Schools Developed in the United States and Canada During the 15-Year Period 1943-1958*

Name of Institution	Originally Founded	Four-Year Program Instituted	First Graduates of Four-Year Program
Medical College of Alabama*	1859	1943	1946
University of California at Los Angeles	1951	1951	1955
University of Miami	1952	1952	1956
University of Florida	1956	1957	1961
University of Mississippi*	1903	1955	1957
University of Missouri*	1840	1955	1957
Albert Einstein College of Medicine	1950	1955	1959
Seton Hall College of Medicine	1954	1956	1960
University of North Carolina*	1879	1952	1954
University of Puerto Rico	1949	1950	1954
University of Texas Southwestern	1943	1943	1944
University of Utah*	1905	1943	1945
University of Washington	1945	1946	1950
University of Kentucky	Currently being organized		1961(?)
West Virginia University*	1902	Four-year program under consideration	
University of Saskatchewan*	1926	1955	1957
University of Ottawa	1945	1947	1951
University of British Columbia	1950	1950	1954

---

* Former two-year school of basic medical science.

The data presented cover the academic year 1957-1958 and have been derived from official sources in all instances. The basic questionnaire on which medical schools submitted their annual data for this report was prepared jointly by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. Presentation of the following information has been made possible through the cooperation of medical school and university officials, representatives of government agencies, and the officials of the technical areas allied to medicine which are included.

The Council on Medical Education and Hospitals desires to express appreciation on behalf of the American Medical Association to those individuals and organizations who have cooperated in furnishing the information on which this current report is based.

FIFTEEN YEARS OF GROWTH

As one reviews the passing scene and notes the dates of establishment of medical schools, the past 15 years have witnessed remarkable developments. During this period 13 additional four-year programs have been activated in the United States and three in Canada. Two other schools (Kentucky and West Virginia) are in development but have not yet implemented their new programs. Eight of these currently activated four year schools represent entirely new institutions, and all but three of them (Florida, Albert Einstein, and Seton Hall) have already been adding physicians to the ranks of the profession through graduation of one to several classes of students. The other five institutions include those which have augmented their programs during this period from former two year schools of basic medical science to four-year degree-granting schools, all of which have graduated classes.

The University of Kentucky is currently engaged in the planning and development of its four-year school but has not yet activated its teaching program. West Virginia University School of Medicine is completing its new facilities and the faculty organization involved in converting from a two-year school of basic medical science to a four-year program.

In Canada, during this period, there have been two entirely new four-year medical schools and one institution which has converted its program from two years of basic medical science to a four-year curriculum.

Table 1 lists the institutions to which reference has been made, giving the original dates of their organization and also the dates when some schools starting as two-year institutions initiated four-year programs. The accompanying photographic reproductions portray these interesting and impressive facilities which have been developed during the 15-year period. In many instances the photographs give only a partial indication of the teaching, research, and clinical facilities utilized. In presenting the photographs of these four-year institutions developed during the 15-year period, it should also be indicated that practically all of the medical schools in the United States and Canada have benefited from additions to their physical facilities during this period and that a complete photographic story of such developments would fill many additional pages.

PROGRESS AND EXPERIMENTATION IN MEDICAL EDUCATION

MAJOR DEVELOPMENTS OF INTEREST

Forty-nine of the 85 operating medical schools in the United States and 7 of the 12 Canadian schools reported major new developments during the 1957-1958 period. These included changes in administrative organization (19 United States and 2 Canadian schools), changes in methods of student selection (9 United States schools), curriculum planning and activation of modified programs (26 United States and 5 Canadian schools), and significantly augmented financial resources (37 United States and 5 Canadian schools). Augmented financial resources covered funds for construction (20 United States and 1 Canadian school), student loans and scholarships (8 United States schools), salary adjustments, maintenance, equipment, research, and basic endowment.

It is significant that during recent years the areas in which most active major changes continue to occur are in matters of curriculum analysis and modification and in the financing of the many costly facets of medical education.

HISTORICAL NOTE ON THE CURRICULUM

In connection with curriculum studies and readjustments it is of interest to recall a historical note. On April 4, 1909, the Council on Medical Education reviewed a schedule of 10 subjects with the number of hours assigned and voted to recommend this 4,100-hour program as a "working schedule for the medical curriculum." In its minutes of that date the Council specifically stated that: "It was the general opinion of those present that this schedule should not be made a hard and fast requirement to which all colleges should comply, and that a strict uniformity of curricula among all colleges was undesirable." The schedule which had been outlined represented the combined opinion of over 100 leading medical educators who had been consulted before it was finally presented.

At their meeting the next day, April 5, 1909, the Council members reviewed their actions of the previous day. Fear was expressed by certain members that some of the state examining boards would adopt the standard curriculum set forth by the Council as a guide and make it obligatory on medical colleges if their graduates were to be qualified for examination. To counteract any such possibility the following resolution was adopted:

> Whereas, the object of the Council on Medical Education in appointing a Committee on Medical Curriculum was entirely educational and suggestive and,
>
> Whereas, the impression prevails among medical teachers and members of state boards that the Council is framing a curriculum for the purpose of having it serve as a standard to which medical schools must conform or be condemned by the state authorities as not in good standing, therefore be it
>
> Resolved, that every publication of a curriculum that hereafter may be made by the Council, its members, or its officers as such, shall state explicitly that the Council does not consider it in the interest of true progress in education that any standard curriculum whatever shall be uniformly adopted by all medical colleges.

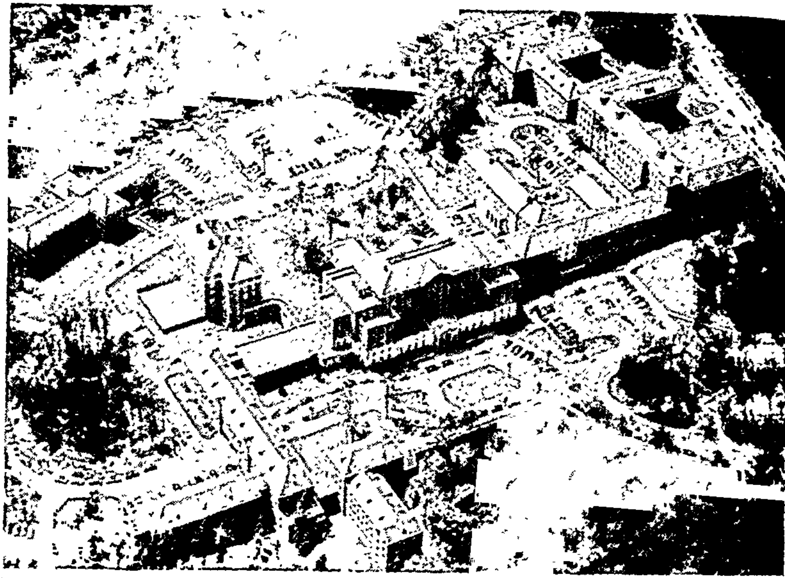
DUKE UNIVERSITY INITIATES NEW PROGRAM

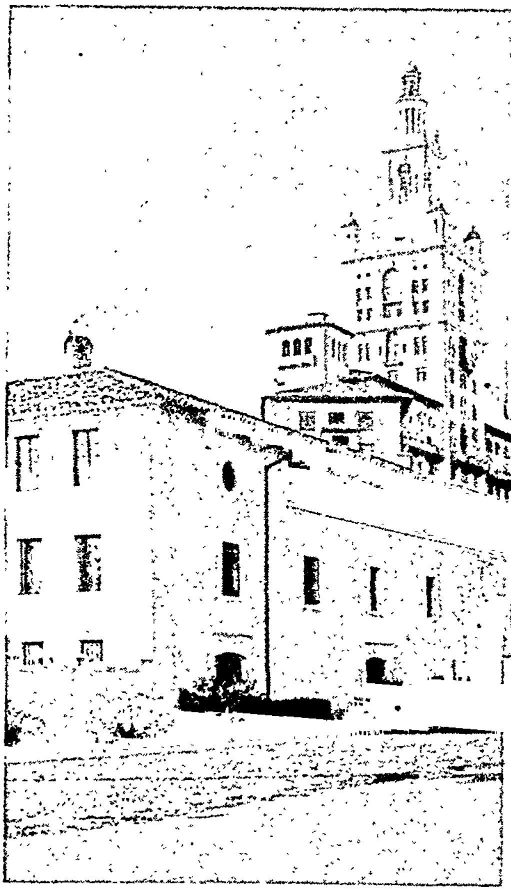
Among the developments of interest to medical education is the recent announcement of plans for a major educational program at Duke University, designed to produce physicians who are also skilled medical research scientists. As presented, the program is planned with the objective of training medical students and hospital resident physicians in the methodology and utilization of research tools and techniques. It is reported that the financial support for the first three years of operation will come from grants totaling over three quarters of a million dollars. Of this sum, approximately $500,000 will be utilized in the provision of quarters and equipment with the balance allocated for salaries and maintenance. The program will be housed in a new four-story addition to the Bell Medical Research Building at the Duke Medical Center. Construction was initiated during the summer of 1958, and it is planned to admit the first class of research students in July, 1959. The faculty will include six full-time teacher-investigators who will become members of the medical center staff. As currently envisioned, the program will be geared to train about 20 students, who will integrate the research training with their regular four-year medical school curriculum. Included also will be house staff physicians, a small number of Ph.D. candidates in the basic medical science departments and in nonmedical sciences. Student selection will be based largely on "evidence of a research bent of an inquiring, critical and original mind," and Duke students will be given priority consideration. The announcement indicated that the individuals composing the planning committee for this program include Dr. Eugene A. Stead Jr., Chairman, Department of Medicine; Norman F. Conant, Ph.D., Professor of Mycology; Dr. David T. Smith, Chairman, Department of Microbiology; and Dr. Joseph E. Markee, Ph.D., Chairman, Department of Anatomy.

RESUME OF FIRST YEAR OF JOINT STUDY OF THE UNIVERSITY OF BUFFALO SCHOOLS OF MEDICINE AND EDUCATION

The University of Buffalo School of Medicine has completed the first phase of a joint study with the School of Education to determine whether the instructional program in a medical school might be strengthened by the development among medical teachers of greater familiarity with educational principles and techniques. The first year of the investigation was devoted to an examination of current medical teaching practices by professionals

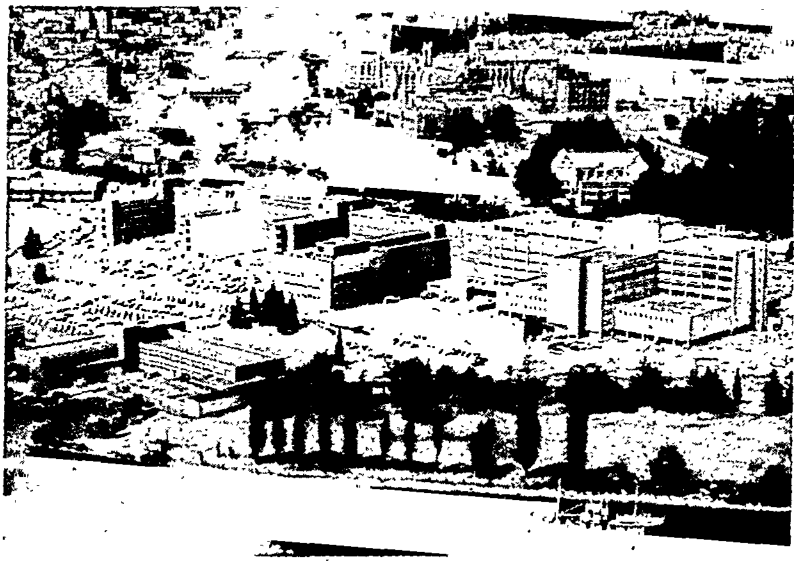
Below. University of Miami School of Medicine, Basic Sciences Building, Coral Gables.

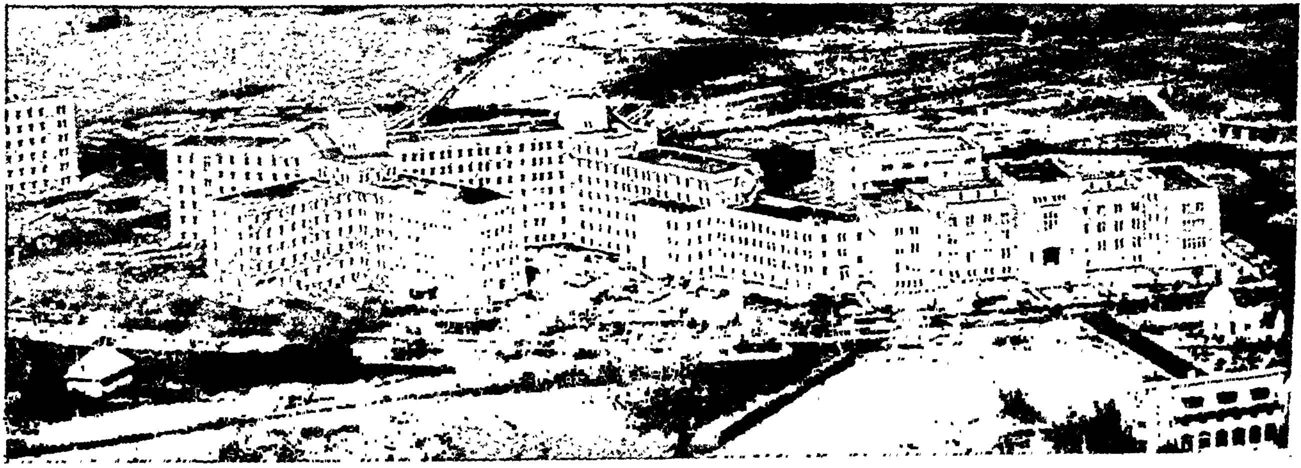


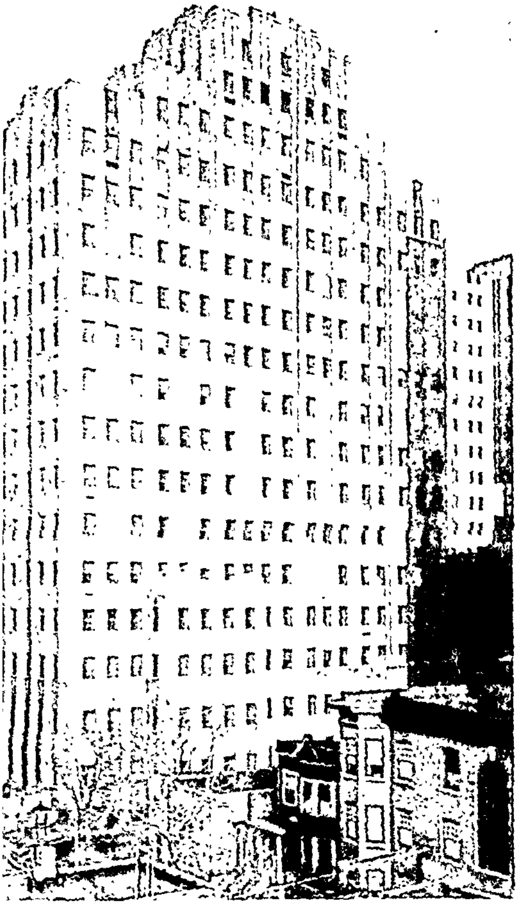


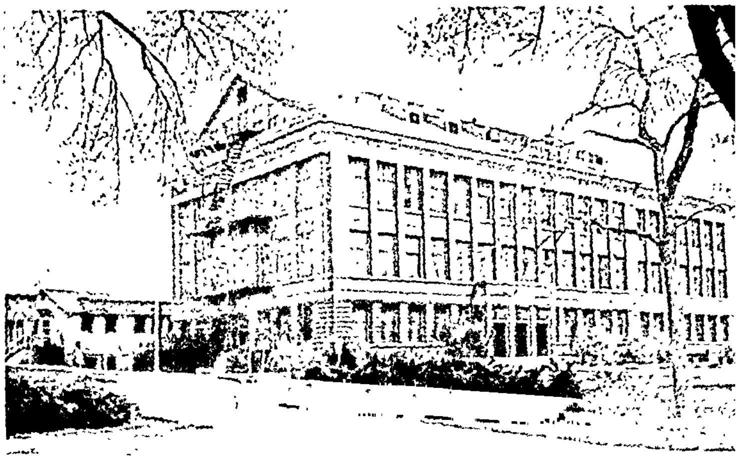
Above, University of North Carolina Medical Center, Chapel Hill.

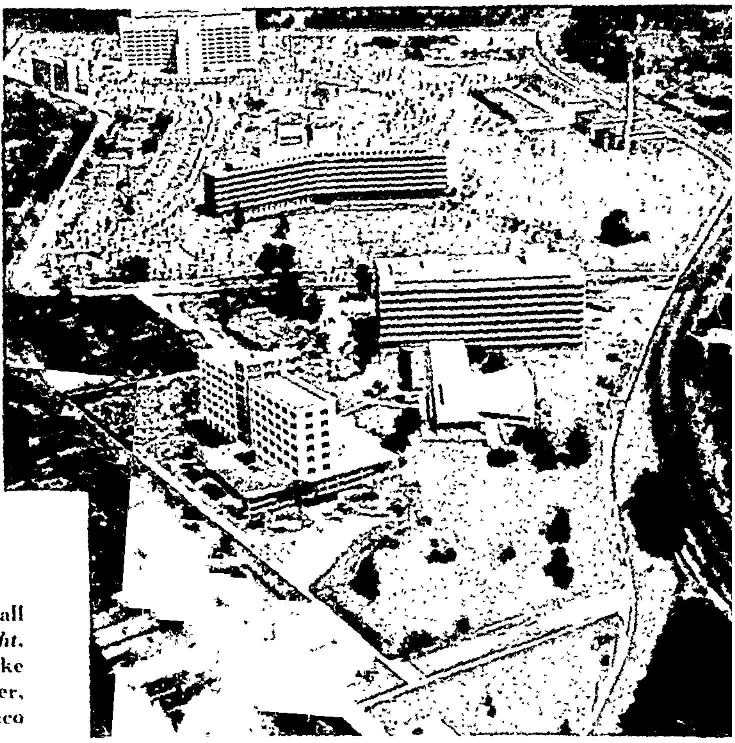
Right, University of Washington School of Medicine, Seattle. *Below*, University of Saskatchewan College of Medicine, Saskatoon, Saskatchewan, Canada.

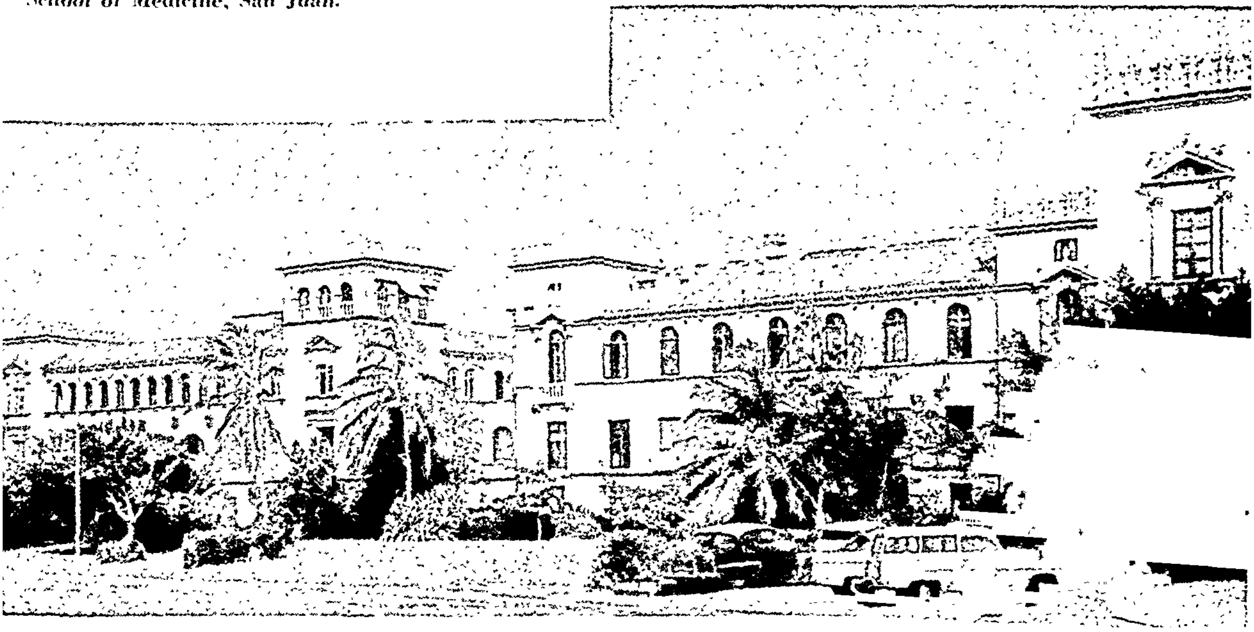




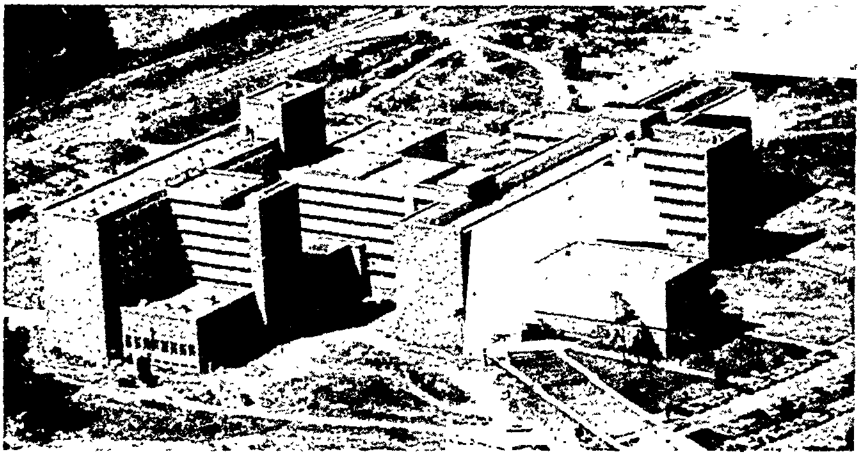




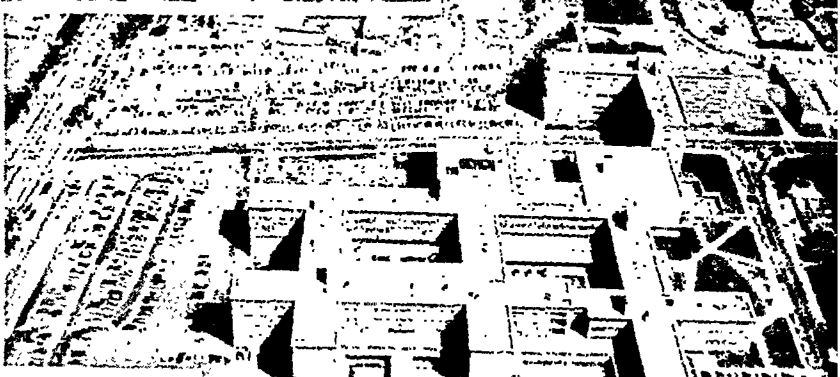




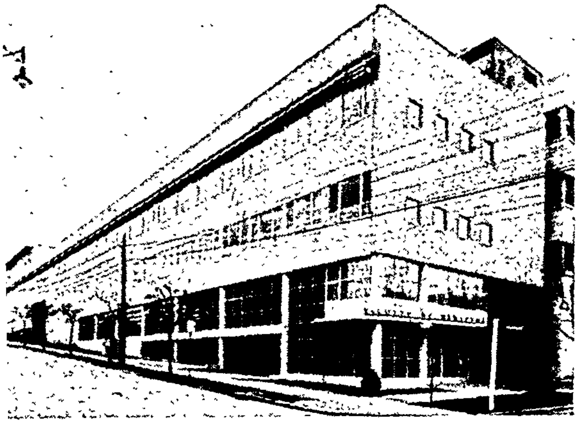
Above. Jersey City Medical Center and Seton Hall College of Medicine and Dentistry. *Above right.* University of Utah College of Medicine, Salt Lake City. *Center right.* Albert Einstein Medical Center, New York City. *Below.* University of Puerto Rico School of Medicine, San Juan.



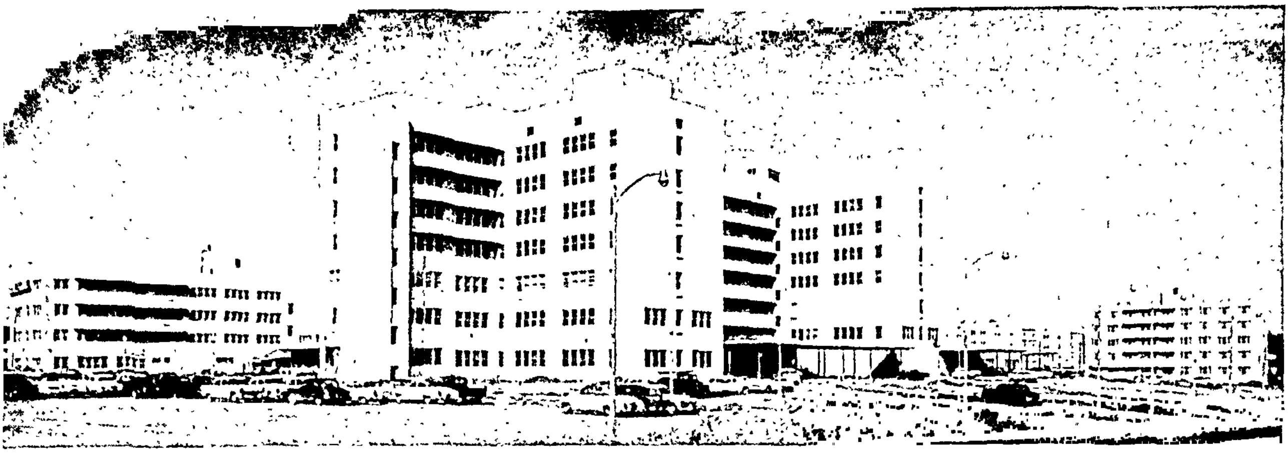
Left, University of Florida College of Medicine, Gainesville.

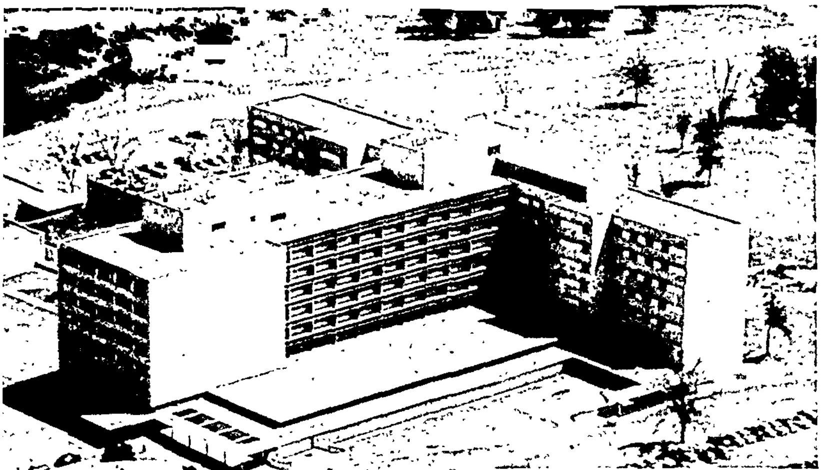


Right, University of California School of Medicine, Los Angeles. *Below,* University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada.

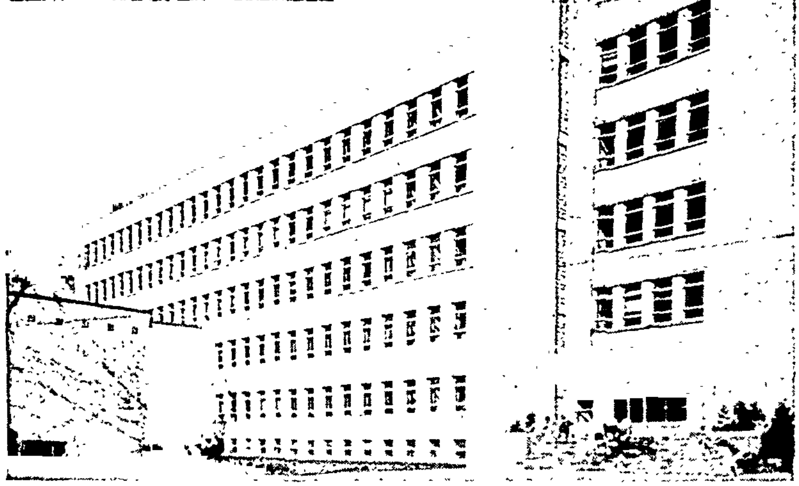


Below, Medical Center of University of Alabama, Birmingham.

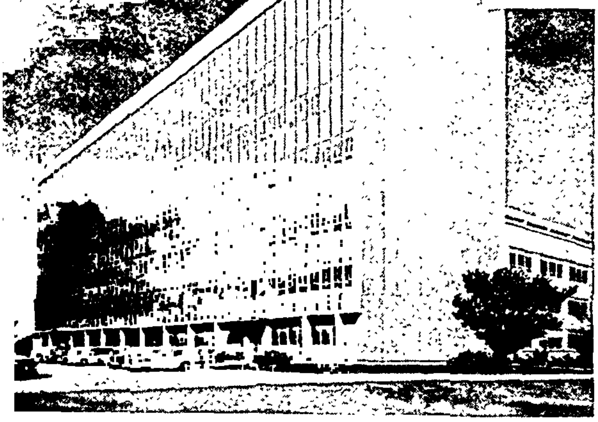




Above, University of Missouri School of Medicine, Columbia. *Left,* University of Mississippi School of Medicine, Jackson.



Right, University of Ottawa Faculty of Medicine, Ottawa, Ontario, Canada.



Left, University of Texas Southwestern Medical School, Dallas.

in education under the guidance of medical faculty members. During the next two years an intensive series of seminars and workshops were conducted jointly by the educational specialists and their opposite numbers in medicine for a small group of medical teachers who gave nearly half time for a full academic year to these studies. The topics which occupied them included the psychodynamics of the learning process and the influence which teaching exerts upon it; the nature of the medical student population and the influence of personal and environmental factors in the student body and faculty upon learning; the historical and philosophical background of higher education as it relates to medical education; and the materials and methods of instruction in a medical school and evaluation of student progress.

The project coordinator has reported that the thirteen medical teachers, representing the University of Buffalo and six other medical schools, who have now taken part in the program, are agreed that professionals in education can make an important contribution to education in medicine. An independent evaluation of the effect of the program upon participants confirmed the impression that both their attitudes and practices had been modified by the experience. The data accumulated during two years of seminars made it possible to identify those items in education which had the greatest impact upon the participating teachers. This information is now being used in the construction of a second phase in this joint project which will have as its objective the provision of a more realistic opportunity for medical teachers to engage in a concentrated period of study of educational principles and techniques in a medical context. The first of a series of two-week institutes on medical teaching was held in June under the joint sponsorship of the University and the Association of American Medical Colleges. It was attended by 25 representatives of 20 medical schools in the United States and Canada. It will be repeated once or twice in the 1958-1959 academic year and at intervals thereafter. In addition to the institutes which provide an opportunity for teachers in other medical schools to share this experience, a continuing series of seminars will be held for the Buffalo faculty.

This program is supported by the Commonwealth Fund.

UNIVERSITY OF WASHINGTON FACULTY TEACHING CONFERENCE

In September, 1957, the University of Washington medical faculty held a two-day conference on teaching in the clinical years. The entire faculty, basic science and clinical department members included, heard reports from some of their own colleagues who had visited outstanding teaching programs at other medical schools. The pros and cons of these programs and the possibility of utilizing certain of their advantageous aspects in whole or in part were thoroughly discussed. This conference was part of a study of patient care and teaching made possible by a grant from the Commonwealth Fund. The fourth of these annual conferences to be held by this faculty was scheduled for September, 1958, and was intended to focus attention on teaching of basic sciences during the clinical years.

REVIEW OF 30-YEAR EXPERIMENT WITH PRECEPTORSHIPS AT THE UNIVERSITY OF WISCONSIN

It is desirable on occasion for an institution to evaluate carefully the program innovations and curriculum modifications which have been made with specific objectives toward improvement of its medical education potentialities. The University of Wisconsin has reported its 30-Year Experiment in Medical Education through the medium of the Wisconsin Preceptor Program. As reported by Bowers and Parkin,[1] the students are enthusiastic over the program and apparently look forward to it as one of the high points of their medical school career. The students who spend 12 weeks out of the 48-week senior year in this program express the belief that this allocation of time for the preceptorship should not be reduced. Those students who have completed the experience indicate that its greatest benefit was the opportunity to see the acute disease problems which they do not encounter frequently at the University Hospital. They also find that their patient relationships are more intimate, penetrating, and more satisfactory as they make the initial contact with them rather than after the various preliminary admitting procedures involved with the patients at the teaching hospital. They have more opportunity to see the patient's family and to understand the total problem as well as to learn how to more effectively talk with patients. The experience with a preceptor sometimes helps to determine the field of medicine that the student decides he does not wish to enter as well as suggesting a possible major field of interest.

Bowers and Parkin indicate a few of the debits that have accompanied the plan. For instance, some students conceive of the preceptorship as an opportunity to prepare for internship. In some situations students see too many patients during the day and develop a tendency to utilize short cuts in their evaluations of individual patient problems. In other instances the student may be allowed to be too much on his own. Some students find they work harder during the preceptorship than during any other phase of their medical education and that there is inadequate opportunity for follow-up study.

Page and Anast,[2] in summarizing an alumni evaluation of this 30-year program, found that those who looked back on their participation in it as part of medical education were generally enthusiastic. It was considered to afford a close teacher-student relationship that had been of genuine value. The study could present no evidence that this preceptor program had acted to encourage graduates to enter the field of general practice or to settle in rural areas. On the contrary, it was of interest to note that the study revealed evidence that graduates of Wisconsin enter specialty practice with as great or greater frequency than the alumni of comparable medical schools which have not included preceptorships in their programs.

WESTERN RESERVE REPORTS ON FIRST EVALUATION STUDIES

It is now 12 years since the faculty of the School of Medicine at Western Reserve University initiated the planning of the program of medical education which was activated in 1952. The new program at Western Reserve was an outgrowth of growing dissatisfaction with existing programs and the conviction that the education of physicians could be improved in a number of ways. As the program developed the faculty has been confronted by questions as to whether it is possible to evaluate it effectively in a way as to provide meaningful results. There has been continuing critical study of the program by a subcommittee on evaluation which was established in 1953 and which has endeavored to develop a broad concept for research in medical education. Dingle and associates[3] have recently outlined the approach to the problem of evaluation and indicated the fields in which their studies are being done. They have suggested the need for suitable evaluation of any program in medical education, and their experience to date has emphasized some of the difficulties inherent in any such effort. Their studies have shown that research in medical education appears to be as greatly needed as it is in other fields of endeavor. In fact, it is suggested that consideration be given to establishing, at the school, an adequately staffed division of education research with the primary concern of (1) evaluation of the effectiveness of the program in relation to objectives and in relation to standards of contemporary medical education; (2) research in student development; (3) research in teaching methods; (4) research in testing methods; and (5) training of investigators in educational research.

The first report of the Western Reserve studies has been presented by Horowitz, Brozgal, and Eaton[4] and deals with observations of first-year students in preceptoral groups. This report presented observations of the reactions of first-year medical students in preceptoral groups in a clinical science program and, to a limited degree, described the behavior of their preceptors. It is recognized that full evaluation of the effectiveness of a program such as that being conducted at Western Reserve University will not be possible until a considerably longer period of "follow-through" has elapsed. This first report, however, presents some important challenging observations which merit careful study on the part of those concerned with ways and means of improving medical education. While the study reports only part of the over-all program, it records observations of positive value that may well be utilized in part by other institutions pursuing experimental reorientation of the early phases of the medical curriculum.

INTRODUCTORY STUDIES IN THE SOCIOLOGY OF MEDICAL EDUCATION

Another valuable contribution in the field of medical education was the publication of the Introductory Studies in the Sociology of Medical Education. In this volume, Merton, Reader, and Kendall,[5] present a collection of papers constituting the first set of reports on continuing studies in the sociology of medical education which were begun several years ago by the Bureau of Applied Social Research of Columbia University. This study was conducted in collaboration with the students and faculties of the Schools of Medicine of Cornell University, University of Pennsylvania, and Western Reserve University. These introductory presentations are apparently intended to be part of a periodic series of reports of special studies in the sociology of medical education which will extend over a number of years before any final comprehensive synthesis will be attempted. Eventually the studies will include the sociological evaluation of graduate medical education which is discussed elsewhere in this current education number of THE JOURNAL.

In its initial section this first report deals with a thought-provoking section on preliminaries to a sociology of medical education, and a resume of the Cornell Comprehensive Care and Teaching Program. The second section is concerned with career decisions such as the decision to study medicine, some comparisons of medical and law school entrants, and tendencies toward specialization in medical training. The third section discusses the processes of attitudinal learning and the final portion of the report presents changes in the Cornell Care and Teaching Program and the range of patient contacts in it. Again, this report brings together in better focus certain aspects of an experimental program in medical education that has been underway for a number of years, presenting data of value to other institutions considering curriculum realignment.

PITTSBURGH OUTLINES PLAN OF EXPERIMENTAL PROGRAM

Moses, Gregg, and Danowski[6] have presented an outline of an experimental curriculum of medical education for modern medicine which is being developed at the University of Pittsburgh. It is designed to permit a small number of students greater flexibility in their college and medical educational experience. The program as suggested would permit those students deeply interested in a scientific career in a medical field to pursue a course more appropriately designed to such an objective. Likewise, it would make it possible for the students primarily interested in becoming family physicians or clinical specialists to participate in educational experiences designed toward such ends. Both scientific and humanistic aspects of the program would be strengthened to permit potential scientists and clinical specialists to initiate the specialized phases of their education at an earlier date. Furthermore, it is believed the curriculum of students electing the clinical practice of medicine will provide a more effective educational experience than the current all-purpose, 9-year course.

At the beginning it is planned to select a small group of students on the basis of their early collegiate experience and permit them to take some of their courses along with regular medical students. Subsequently, the curriculum of these students will be modified in accord with their interests and abilities so as to provide both a sound general education and a more effective basis for their ultimate career objective. This would be accomplished through the judicious utilization of summer periods and reorienting of students through the current departmental structure to provide the most effective individual objective. The individualization required by such a program will necessitate careful and exacting counsel and guidance and will be interesting to observe in action.

ANNUAL TEACHING INSTITUTE OF ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The 1957 Teaching Institute of the Association of American Medical Colleges, held in Atlantic City, Oct. 16-19, focused attention on the ecology of the medical student. This was the second successive institute which was primarily student-centered, the preceding one having dealt with the appraisal of applicants to medical schools. The major areas considered included (*a*) the various intramural forces affecting medical students; (*b*) the diversity of values and objectives in medical education; (*c*) noncurricular factors affecting medical students; (*d*) the development of professional attitudes and capacities; and (*e*) educational patterns for medicine. The 1957 Teaching Institute stimulated further interesting and critical self-appraisal and intercommunication in regard to the student in the process of medical education.

The 1958 Institute conducted at Swampscott, Mass., Oct. 7-11, was the first of the institutes dealing with clinical teaching. Many individuals in medical education have been awaiting with interest and anticipation the first of the clinical teaching institutes. This institute dealt with such areas as (*a*) objectives of clinical teaching and (*b*) the variation of emphasis in objectives such as (1) the case for emphasis on the practical and encyclopedic, (2) the case for emphasis on social forces and environment, (3) the case for emphasis on scientific method, (4) "The Science, the Art and the Heart; A Synthesis of Objectives in Clinical Teaching"; and (5) the extramural forces influencing medical education from the point of view of the philosopher, the economist, and the behavioral scientist. It also dealt with the setting of clinical teaching including medical service in the teaching hospital, the relationships of a university to a teaching hospital, and hospitals and clinical teaching. The third general topic centered on the student, the patient, and the teacher and covered considerations of the clinical teacher and scholarship as the heart of the educational process. It also considered student participation in the teaching process, patient care as a social process, and a presentation of clinical teaching in the European system of medical education.

There is no question but that the previous institutes sponsored by the Association of American Medical Colleges have led to markedly enhanced intercommunication between medical faculties throughout the nation as well as within the schools themselves. The follow-through from the 1958 institute promises to continue in the further stimulation of this desirable trend.

FOCUS ON FUTURE NEEDS IN MEDICAL EDUCATION

CHALLENGES TO MEDICAL EDUCATION

At the 54th Congress on Medical Education and Licensure held in Chicago, Feb. 9-11, 1958, attention was focused on the challenges and future needs in medical education. The reasoning behind and the purpose of this Congress was presented by Dr. Leland S. McKittrick,[7] Chairman of the Council on Medical Education and Hospitals, by posing the question: "Are those responsible for supplying medical needs to the people in this country aware of what these needs will be in the forseeable future, say in the next 15 to 20 years; and are proper and effective efforts being made to meet them?" Doctor McKittrick indicated the emphasis that had been placed on physician-population ratios and raised a second question as to whether the answer to this situation was as simple as the production of new physicians in proportion to the increase in population.

Addressing the Congress as President of the American Medical Association, Dr. David B. Allman[8] indicated that: "changes affecting every aspect of human life are occurring at an ever accelerating rate" and that "they have presented new problems and challenges to medicine and its allies as well as to other areas of activity." These changes have been reflected by "sincere concern in regard to the education, training, and development of the personnel needed to meet and solve effectively the problems with which they will be challenged."

Dr. Allman further commented:

> It is not surprising that, with the current widespread interest in health, this changing scene has been accompanied by representation from various sources of increased needs for medical and allied personnel. No one will deny that, as our population grows at a rate far beyond estimates of a few decades ago, as health consciousness continues to grow, and as new problems arise, there will be continuing need for increased numbers of well trained medical personnel. This will necessitate the facilities, finances and faculty essential to their education and training.

He reflected the concern of other thoughtful individuals:

> In the current complex setting it is not possible to plan for medical personnel needs in simple arithmetical physician-population ratios as might have been the case in earlier years. One fact, clearly certain, is that efforts to compare unqualified statistics for physician-population ratios in recent years with those early in the century is not only meaningless, but actually misleading.

Dr. Allman pointed out, as has the Council on Medical Education and Hospitals on previous occasions,[9] that the question as to "How many doctors are enough?" has become increasingly difficult to answer. Such a reply necessitates a detailed knowledge of trends in medicine and medical practice as well as efforts to forecast further population growth and shifts, continued social and economic readjustments, and the constantly increasing dimensions of scientific knowledge.

Because of its direct relation to the theme of this section of the 58th Annual Report on Medical Education in the United States and Canada, the final paragraphs of Dr. Allman's address are quoted in full.

> American medicine is deeply and sincerely interested in the future education and training of the nation's physicians. It has a right to be proud of the responsible role its Association, in cooperation with other organizations, has played in the development of the high standards of medical education and medical care which exist in the United States today. If we are to maintain high standards and play our role of responsibility in the fulfillment of the needs that lie ahead, American medicine must objectively look at current trends in population, society, economy, and at the vastly changing dimensions of knowledge within its own field in an effort to clearly define some of the questions to which answers must be found.
>
> Today danger confronts our civilization, but opportunities greater than any existing before are also present. Opportunity can be lost if responsibility is side-stepped. One may not be responsible for something that happens when his eyes are shut; but even so, he may eventually be called to account for having his eyes closed at the very moment when they should have been wide open and alert.
>
> We in American medicine must carry our responsibility in objectively and constructively playing our role to assist in defining as clearly as possible the questions concerning future needs for the education and training of physicians. "Responsibility," it is said, "walks hand-in-hand with capacity and power," and the manner in which it is utilized can be the determinant of any individual or group's contribution to his fellow men.
>
> Norman Cousins has recently stated: "What the Nation needs today even more than scientists is men of wisdom and vision. It urgently needs men with the clear and full view, men who understand what is happening in the world and are not continually being taken by surprise by living history and the effects of recognizable causes."

The subsequent presentations of Kirk,[10] Parsons,[11] Kestnbaum,[12] and Hussey,[13] clearly and succinctly portrayed to the Congress the current trends and challenges of the changing characteristics of our population, society, economy, and the changing dimensions of medical knowledge. Each of these four areas was carefully considered by workshop groups who subsequently reported their conclusions to the Congress. These basic challenging background presentations and the workshop resumes appeared in the May 3, 1958, issue of The Journal and merit careful study on the part of all individuals interested in any or all aspects of this matter of projection of estimated needs in the field of medical education.

The Congress also focused attention on some of the problems in specialty training resulting from the changing status of the patient. The background for this study was portrayed by Dr. Ward Darley,[14] Executive Director of the Association of American Medical Colleges, who pointed up the problems in undergraduate medical education associated with the changing status of the patient as well as some of the other specific challenges confronting this field in the area of financing and faculty policies. The specific challenge on problems in specialty training created by the changing status of patients was presented by Dr. T. Stewart Hamilton.[15] Zintel,[16] Williams,[17] Lawson,[18] and Barnes[19] outlined the manner in which surgery, medicine, pediatrics, and obstetrics and gynecology may meet some of these problems in graduate medical education. Burgess and Leonard,[20] presented the manner in which the community hospital may play an important and significant role in graduate medical education today.

The 55th Congress on Medical Education and Licensure scheduled for Feb. 8-10, 1959, will focus attention on the areas of specialism and research. The role of research in relation to medical education has become increasingly important over the years and now presents many facets that merit serious study as plans are developed for new medical schools and for progressive realignment of activities in those currently in existence. How can medical education and medical research be further developed to their best mutual advantage? Where is mutual advantage lost in the more direct interests of either education or research? How can research best contribute to medical education, and how does medical education strengthen research activities? These and many other questions of deep interest and concern to medical educators, those engaged in higher education in areas other than medicine but having potential contributions to it, hospital administrators, and those concerned with current specialty education and training should make this program one of very real interest. Some of the current trends in specialization have likewise given cause for careful scrutiny. The trend towards increasing inflexibility in some specialty areas, the means of evaluation of residency and other forms of specialty training, the emphasis on time as a measure of adequacy of training, the problems involved in evaluation of quality and content of education and training in the specialties, the specialty boards, the Advisory Board for Medical Specialties, and the residency review and conference committees will all enter into the considerations to be given to this area of medical education.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS SUPPORTS DEVELOPMENT OF ADDITIONAL FACILITIES FOR BASIC MEDICAL EDUCATION

The 1956-1957 Annual Report on Medical Education in the United States and Canada[21] included a statement on the future need for physicians which had been prepared by the Association of American Medical Colleges. The Council on Medical Education and Hospitals[22] has previously indicated the existence of the challenges in this field presented by the increasing population, rapid accumulation of scientific knowledge applicable to medicine, and the changing social and economic facets of the American scene. The Council on Medical Education and Hospitals as is indicated in the following statement supports its own previous comments and those of the Association of American Medical Colleges as to the desirability of developing additional facilities for medical education.

Through the medium of its various activities and particularly in its Annual Report on Medical Education in the United States and Canada, the Council on Medical Education and Hospitals of the American Medical Association has endeavored to present and interpret the changing scene in medical education to the profession. With the support of the medical profession and in cooperation with the Association of American Medical Colleges, the American College of Surgeons, the American College of Physicians, the various specialty boards, the Joint Commission on Accreditation of Hospitals, the American Hospital Association, and other organizations, constant and sincere efforts have been made to assist in the advancement of medical education in keeping with the knowledge, trends, and needs of the period.

In recent years the position of the American Medical Association in regard to present and future needs in medical education has frequently been misinterpreted by many individuals and by some organizations through the misuse of statistical data. Statistical information has at times been taken out of context and interpreted to the effect that the official position of the American Medical Association is that there is no need for increased numbers of physicians. No such official position has ever been enunciated. American medicine, as was indicated earlier in this report in reference to Dr. Allman's comments at the 54th Congress on Medical Education and Licensure, fully recognizes the needs being brought about by the increasing population, social and economic trends, and the changing dimensions of medical knowledge and its application. The primary concern of American medicine is that these needs be carefully analyzed and that they be met as a result of sound developments based on the best possible knowledge.

The Council on Medical Education and Hospitals recognizes that the physician-population ratios, on which most current projections of medical personnel have been made, have remained relatively constant for a number of years. It is difficult, however, in the rapidly changing modern scene, to determine whether this relative ratio of physicians per unit of population might be reduced or should be augmented to meet the medical care, teaching, and research challenges of the future. On the other hand, the increasing population together with the various other facets of the shifting pattern obviously indicate the need for constantly increasing the number of physicians. This necessitates consideration on the part of existing medical schools as to possible augmentation of the number of students admitted as well as the development of new facilities. Furthermore, the Council believes it is a logical function and responsibility of American medicine to encourage institutions of higher education where medical education has not been undertaken in the past to give serious consideration to the development of opportunities in this field if all other factors make it appear desirable to do so. The Council on Medical Education and Hospitals sincerely believes it is a responsibility of the American Medical Association to take effective leadership in presenting these increased needs as objectively as possible.

The Council on Medical Education and Hospitals and the Association of American Medical Colleges, independently and through the Liaison Committee on Medical Education, are on record in encouraging the consideration and creation of both four-year programs of medical education and of two-year programs of basic medical science, where institutions of higher education offer the setting which would make such developments mutually advantageous and desirable.

FUNCTIONS AND STRUCTURE OF A MODERN SCHOOL OF BASIC MEDICAL SCIENCES

Because of interest in the contribution to medical education that might be made through the development of thoroughly excellent, additional two-year Basic Medical Science programs, the Council on Medical Education and Hospitals of the American Medical Association, and the Executive Council of the Association of American Medical Colleges have collaborated in preparation of a document or guide outlining their essential features. This statement entitled "Functions and Structure of a Modern School of Basic Medical Sciences" has been approved by the two Councils, and the Liaison Committee on Medical Education subsequently endorsed it.

The general format of this document follows that of the collaborative statement on "Functions and Structure of a Modern Medical School" which was published recently to replace the former "Essentials of an Acceptable Medical School." After presentation to and approval by the House of Delegates of the American Medical Association and by the Association of American Medical Colleges at their next meetings (A.A.M.C., October, 1958; A.M.A., December, 1958), the statement will be published for distribution as early as possible.

REPORTS OF CURRENT INTEREST TO MEDICAL EDUCATION

COOPERATION IN MEDICAL EDUCATION

The 1957-1958 Report of the Council on Medical Education and Hospitals to the House of Delegates of the American Medical Association includes the following comments concerning cooperation in Medical Education.

> In 1942, after consultation with, and approval by the Board of Trustees, the Council developed an official working relationship with the Association of American Medical Colleges, the official organization of the medical schools, through the establishment of a Liaison Committee on Medical Education. Through this arrangement, it has been possible to share responsibilities, problems, challenges, and viewpoints in the many areas where the Council and the Association of American Medical Colleges have mutual concern and similar objectives.
>
> The effectiveness and productiveness of this liaison has resulted in the development of somewhat similar working relationships with appropriate organizations in other fields of concern to the Council. The responsibilities and objectives in graduate medical education and specialty training clearly overlap with those of the Advisory Board for Medical Specialties and with the individual specialty boards. This field of mutual endeavor now has formal expression through a Liaison Committee with the Advisory Board and through the various residency review committees. Similarly, the Internship Review Committee was formed to give other organizations that have a legitimate stake in the internship (e. g., the American Academy of General Practice, the Association of American Medical Colleges, American Hospital Association, and the Federation of State Medical Boards) an opportunity to share viewpoints and efforts in this part of the Council's activities.
>
> There are many other effective working partnerships now in existence and, at the present time, with the concurrence of the Board of Trustees, planning is underway to establish a liaison committee consisting of representative of the Board of Trustees, the Council on Medical Education and Hospitals, University Presidents, and the Association of American Medical Colleges. It is believed that this holds great promise for future better understanding and relationships on the part of organized medicine and its agent in medical education, the Council on Medical Education and Hospitals, with universities, who are ultimately responsible for the conduct of medical schools, and the Association of American Medical Colleges, which can be considered as the universities' agent in medical education.
>
> The Council is of the sincere belief, based now on many years of direct experience, that this approach of cooperation and collaboration has worked to the distinct benefit of the Council's major objective as charged by the House of Delegates many years ago to "make suggestions as to the means and methods by which the American Medical Association may best influence favorably medical education' and to 'act as the agent of the American Medical Association (under instructions from the House of Delegates) in its efforts to elevate medical education."

COLLABORATION WITH THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

In cooperation with the Association of American Medical Colleges, the Council on Medical Education and Hospitals has prepared a number of important basic documents dealing with matters of concern in medical education. The former "Essentials of an Acceptable Medical School" prepared by the Council and authorized for publication by the House of Delegates of the American Medical Association has been replaced by "Functions and Structure of a Modern Medical School," representing the combined efforts of both groups. It was approved by the House of Delegates of the American Medical Association in June, 1957, by the Association of American Medical Colleges in October, 1957, and published in late fall of 1957.

On June 1, 1958, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges authorized and published a statement on "The Present and Future Status of Foreign Medical School Credentials in the United States." This statement includes informative data on the Educational Council for Foreign Medical Graduates, the present and future status of the list of foreign medical schools, the present and future status of graduates of foreign medical schools seeking internship and residency training in the United States under the Exchange-Visitor Program, and those entering the United States on permanent (immigration) visas. It also includes information on the status of American citizens studying medicine outside the United States and Canada, the policy of the American Hospital Association concerning graduates of foreign medical schools, and the policy of the National Intern Matching Program in regard to such individuals.

For many years the Council on Medical Education and Hospitals has sent out an annual questionnaire to each medical school in the United States and Canada for information on which the data in the education number of The Journal have been based. In order to overcome needless duplications and to obtain identical and more comprehensive information for the Council on Medical Education and Hospitals and for the Association of American Medical Colleges, this year the annual questionnaire has been developed as a collaborative effort.

In these and many other areas there has been excellent liaison between the American Medical Association and the Association of American Medical Colleges. The "top level" liaison mechanism which will include representation from University Presidents and the Association of American Medical Colleges, on the one hand, and the Board of Trustees of the American Medical Association and the Council on Medical Education and Hospitals, on the other hand, holds great promise in the future for the discussion of problems of mutual concern. It should result in minimizing areas of difficulty and misunderstanding such as have been precipitated during recent years by the changing character of medical practice, the changing status of the patient, and the changing character of the faculties of medical schools.

FINANCING MEDICAL EDUCATION

THE CARROLL STUDIES ON COSTS OF MEDICAL EDUCATION

There is a continuing interest in relating medical school operating expenditures to the functions the expenditures support. Mr. A. J. Carroll, Business Officer of the State University of New York, Upstate Medical Center, on request, submitted the following statement pertinent to this important matter.

Medical education today faces serious financial problems. However, we can be sure that if they are reported efficiently they will get wide attention and be dealt with efficiently. For the most part, failures and delays in coping with these problems have been the result of inadequate financial reports.

The people of this country want, and will always demand, the best in medical care. They have established standards of excellence for health care, and by so doing they have set the standards for medical research and for their hospitals, doctors, and medical colleges.

For all branches of medicine the fountainhead of quality is medical education; anything that affects medical education will also affect medical research, medical practice, and medical care. Consequently, the problems of medical education are important not only to educators but to those in the health professions and to the general public.

To attain and maintain high standards a medical college needs money. An adequate supply of money will not guarantee a high level of operation by a medical college, but if there is a lack of sufficient funds over an extended period, substandard operations and results will be inevitable. Despite the large amounts of money which have been provided to the medical colleges, it can be stated categorically that their financial support has been inadequate; that the over-all quality of medical education has been adversely affected by this inadequacy; that the standards of medical care, as set by the American public, have not been fully met; and, that this failure to meet standards will grow gradually worse until more adequate support is provided.

While medical education holds the key which can give or deny the best of medical care to the American public, less than 1% of the nation's bill for medical care is being spent for medical education. This is seed money, the smallest but most productive portion of the total medical care bill. Buying anything but the best in this area would not only be uneconomical and unwise, it would endanger the health and security of our nation.

Importance of Financial Reports: We can be sure that the American public wants, and will pay for, the best in medical care, but we can be equally sure that they will insist on getting full value for their money. Therefore, it is essential that their concepts of full value be based on a clear understanding of the vital relationship between medical care and medical education. The amounts needed for medical education may appear small compared with the total costs of medical care but they loom large indeed when compared with the costs of other educational programs.

Educators, doctors, students, health personnel, legislators, government officials, university officials, and the general public—all are confused about medical education, what it costs, what it means to them, what they are paying for it, and what they should be paying.

They are confused because few medical colleges have reported costs and financial data that can be appropriately compared with those of other medical colleges, why its costs are more or less than those of other colleges, the actual cost of educating a doctor, the cost of each instructional, research, and service program, and by whom and to what extent each of these programs is supported.

Without this kind of financial information how can a medical college appraise the efficiency of its own administrative practices and policies? How can it prove that each dollar entrusted to it is being used efficiently, substantiate its proposals for improvements, and know to whom it most appropriately might look for additional support? How can it benefit most from the experiences of others? Without such information, those upon whom the colleges depend for financial and moral support will remain confused and will be seriously handicapped in their efforts to provide the colleges with sufficient operating funds.

Inadequacy of Medical College Financial Reports: The foregoing does not imply that medical colleges do not keep books or prepare financial reports. Every college reports its income and expenditures, but the reports have been misleading. Recent studies have shown that the basic reason for this is the complete lack of uniformity in medical college budgeting, accounting, and reporting policies, practices, and terminology. As a result, the "costs" reported by each college reflect entirely different combinations of university, medical center, and medical college activities and expenses. Such costs are not suitable for comparisons.

Income reports have been defective because medical college "income" has not been precisely defined. For example, some colleges report tuition receipts as medical college "income" even though they are deposited in the general funds of the university or state and cannot be used for the support of college programs. For colleges that follow this practice, tuition represents "earnings" but not "income." Colleges may report state budget appropriations or university general fund budget allocations as "income" while in reality only the portion of these appropriations that is spent benefits the colleges and is the equivalent of "income." Often the unspent balance remains in, or reverts to, the university or state general funds. If a medical college retains the unspent balance, the entire appropriation or allocation should be reported as "income." However, if these unspent amounts are reappropriated for the following year, they should not be reported again as "income." In response to questionnaires some medical colleges have reported the same money as income in two or more successive years. Where these illustrations apply, income may be overstated, possibly to the detriment of the college.

Financial support for the medical college which comes indirectly through the university, hospitals, special funds, or other agencies seldom is reflected in the "income" report. In such cases "income" and "sources of financial support" are not the same.

For these and other reasons medical college "income" reports have been indefinite and have had limited significance for comparative purposes. To provide appropriate comparisons, reports of the "sources and amounts of financial support for medical college programs" are necessary. Obviously, all such reports should be prepared in accordance with uniform practices, and the terminology should be defined precisely.

Most medical colleges report their "expenditures" as "costs," and cost reports, for the most part, have been budget reports—the amounts actually spent under the medical college budget. The trouble is that the "expenditures" of a college seldom represent the true "costs" of medical college operations —the actual values that are being sacrificed to support the medical college programs.

The university may contribute a variety of business, plant, library, and student services and expenses; hospitals, clinics, special funds, and other organizations may pay faculty salaries or contribute essential facilities and supplies for the support of activities or functions common to all medical colleges. Medical college "costs," to be useful and comparative, must include these values, even if they are not charged to the medical college budget. Suppose, on the other hand, that the "expenditures" of a medical college include support of activities and programs that normally would not be charged to a medical college. To produce comparative "costs" these expenses must be identified, set aside, and excluded from "medical college costs." In other words "medical college costs," to be appropriately compared, must reflect the total costs of an identical combination of medical college programs and activities—the programs and activities common to all medical colleges.

Despite the complicated programs, responsibilities, and relationships which make medical education unique in comparison with other university and government activities, there have been continuous attempts to fit medical colleges into the normal management patterns of colleges, universities, and states. Not enough thought and effort has been applied to the special problems of the medical colleges. To illustrate this, let the medical college administrators ask themselves, "What is our accounting accounting for?"

For years the medical colleges have been telling those responsible for approving and supporting their programs *how* they have spent their money—the salaries and expenses they have paid and the things that they have bought. This is useful information for day-to-day management purposes, but trustees, legislators, and many others draw dubious comfort from reports which place major emphasis on the colleges' success in spending hard-to-get funds. They would rather be told what they are getting for their money.

This calls for program accounting and reports to show the costs of undergraduate education, graduate education for advanced degrees, intern and resident training, continuation education, medical research, community health services, patient services, etc. These are the programs for which a medical college is primarily responsible. To tell what it has done, what it is doing, and what it plans to do, a college must report in terms of these programs; and such reports, to be meaningful, must be expressed in dollars, the language of business.

With program costs, figures are supported by related facts, the cost of educating a doctor can be reported, and the common but improper method of determining per-student costs by dividing total medical-college costs by the undergraduate enrollment can be discarded. With program costs a financial profit or loss figure can be determined for each college program. By carefully relating program costs and the sources and amounts of financial support, a medical college can tell the extent to which various persons, organizations, or segments of the general public are benefiting from its operations and so will know to whom it can justifiably look for additional financial support.

This is financial reporting for everyone because it tells everyone what he is getting for his money; it presents a comprehensive, nontechnical picture of medical education. Program accounting and reporting also will be used extensively for future planning, for budget justifications, and as a check on over-all operations. It is a once-a-year procedure and, therefore, inexpensive.

For these things alone, program accounting will be justified. It should be understood, however, that it cannot replace the customary, detailed object-of-expenditure type of accounting for day-to-day budgetary control.

In this country management generally has accepted the Whitehead philosophy that a fact in isolation is of little significance. So few persons would question the desirability and the need for comparing cost and financial data that a lengthy justification of efforts to produce comparative data is not necessary. The principal reasons are the following. 1. Through appropriate comparisons one college can benefit from the experience of others and avoid unnecessary experimenting. 2. Reliable comparative data will be essential for the planning of new medical colleges and the expansion, enlargement, and improvement of those now in existence. 3. Comparative information will make it easier for those responsible for medical education to evaluate the programs and financial needs of medical colleges. In the past the lack of such data has resulted in inaccurate evaluations and inadequate financial support. 4. Quantitative reports, comparisons, and analyses are more meaningful to the general public and will influence public opinion more than individual reports would. 5. Granting agencies and foundations need quantitative and comparative financial data to determine the relative needs of individual colleges, to serve as guides for policy making, and to help them make equitable distributions of available funds.

Cost comparisons are inevitable. If those directly responsible for medical education do not make them, others will do it for them. When others do it, the comparisons will usually be made on the basis of incomplete facts and figures and will be inappropriate, dangerous, and harmful.

At this point, one might well ask: What has been done to improve medical college financial reporting? Why hasn't budgeting, accounting, and reporting uniformity been established? Why aren't program costs in common use?

For several years the need for more meaningful financial reporting has been recognized at all levels of management. Financial studies have been made, and several of them have produced ideas which with proper support and application could have led to improved reporting and uniform financial practices. However, the necessary support and cooperation did not develop and the potential long range benefits of several good studies were lost.

The colleges have told about their complex programs and have explained how these programs are so intermingled that they cannot be separated, that it is impossible to distinguish the cost of educating a doctor, the cost of research conducted by the college, etc. That these explanations have been accepted year after year without serious challenge is a tribute to the faith of the American public in its doctors. However, medical education costs have become so high that new sources of support must be found. In seeking additional support, medical colleges are competing with other worthwhile proposals. To compete successfully, they must be able to describe their needs and their operations in terms of cost and in terms that will be understood and accepted by all concerned. Program costs will be essential.

Plans for Improved Financial Reports: The report of the recent State University of New York cost study[23] demonstrates rather conclusively that medical college fiscal operations can be analyzed in a manner that will produce appropriately comparable medical college costs. It provides detailed procedures and directions to help other medical colleges to study and analyze their own operations and compare them with the nineteen colleges covered by the report; it also describes a practicable, inexpensive system of program cost accounting and reporting. Another recent report[24] deals principally with a program analysis of medical education costs at Emory University. This report will help any medical college to understand and use program accounting more effectively. There is no serious conflict between either the principles or the methods of program cost analysis described in these two reports.

The Association of American Medical Colleges recognizes[25] "the inability to develop and report information that will permit the fiscal understanding of the manifold activities of our nation's teaching medical centers" . . . as "one of the major problems facing medical education." The Association has assumed a role of leadership to resolve this problem and it appears that it will have the enthusiastic support of all concerned.

During 1958 the Association has published the Emory University[24] and State University of New York[23] reports, and it has also obtained a grant from the W. K. Kellogg Foundation to finance a one-year "Study of Medical College Financing."

In brief, the major objectives of this study are (*a*) to develop methods to be used by all medical colleges for routine, periodic financial analyses and reports and to make a pilot study of six or eight colleges to test and prove the principles, definitions, checklists, analyses, methods, and procedures which eventually will be used for a nationwide financial study. (This will involve studying and standardizing basic fiscal policies, practices, and terms), (*b*) to develop a practicable and inexpensive system of program accounting and to help the colleges to place the plan in operation, and (*c*) to study and clarify related fiscal and management problems.

After the analysis, interpretation, and reporting of the pilot study findings, another objective will be to prepare a proposal including forms, procedures, staff, and budget that will permit the application of this study to all medical schools that are willing to be so studied.

The committee for the pilot study believes that a questionnaire type study will not suffice. Personal visits will be made by the study director to make sure that each item of information is correctly understood and reported and to check on the interpretation of questionnaire inquiries. The personal contacts also will be in line with the committee's recognition of an essential need for a continuing educational program to help medical college administrators to adopt and use uniform management methods and reports. The A.A.M.C. doubtless will assume leadership in such an educational endeavor. In this pilot study major emphasis will be placed on the long range, continuing benefits to come from the development of uniform accounting, budgeting, and financial terminology for the use of all colleges, and the development of procedures and plans for routine, periodic financial reporting by all medical colleges.

It is apparent that medical colleges have been the victims of over simplification, and as usual the oversimplified reports have been misleading. In the new study the axiom that an accounting system or report cannot be more simple than the complexities to be dealt with will not be overlooked.

A satisfactory financial report for a medical college cannot be simple. However, completely new accounting systems rarely will be needed. It will be necessary merely to establish standard terms and consider facts as well as figures so that differences can be recognized and adjusted for reporting purposes. The individuality of a college will not be lost or even threatened.

This study is well under way, and there is every evidence that within the foreseeable future those who are responsible for medical education and its financing will be consistently guided and fortified by complete, reliable financial and operating facts and figures. For the first time they will be able to prove the financial needs of medical education and establish new standards of management efficiency. The important role of medical education in the United States will be more fully appreciated, and more adequate financial support will be provided.

AMERICAN MEDICAL EDUCATION FOUNDATION

To acquaint readers with the activities of the American Medical Education Foundation the following report has been submitted by its executive director.

Almost eight years old, the American Medical Education Foundation continues to show concrete progress in its efforts to mobilize support for the schools from the medical community. Its total income since 1951 has now passed the 7 million dollar mark. During 1957 it received 44,155 contributions, an increase of almost 5,000 givers over the previous year, and it distributed $984,787 in grants to the medical schools from its 1957 collections during February, 1958.

This significant sum of money was raised through physician committees in state and county medical societies across the country. These committees have been developing steadily in each state and now have a degree of permanence and acceptance that outweighs the income each has secured because the active interest in, and sympathy for, the medical schools and their problems adopted by these committees are creating an opportunity for better communications between the profession and the schools.

TABLE 2.—*Physician Giving to Medical Schools in the United States Showing Restrictions on Use Money Made by Donor*

Restriction	Amount of Contributions
Unrestricted	$1,467,067.51
For teaching budget	48,852.55
For specific department	85,806.37
For building fund	895,946.91
For research	201,015.18
For scholarship and student aid	71,750.74
For library	8,810.08
For endowment	123,272.52
Others	115,018.54
Total	$3,020,600.43
American Medical Education Foundation	984,787.00
Totals	$4,005,387.43

During the past year the Foundation has continued to explore ways in which its efforts and those of the alumni arms of the schools could be coordinated. A meeting between the Foundation's board of directors and representative alumni directors was held in February at which time the possibilities and problems of such coordinations were discussed.

As a companion to these explorations, the Foundation continues to collect data from the schools on physicians giving directly to the schools. Until two years ago those reports were limited to unrestricted contributions. In 1956 and 1957 all physician giving was tabulated by the restriction placed on the gifts by the donor. In this way a truer picture of the financial support received by the schools from the medical profession was developed. Table 2 shows these totals by restriction.

This steadily increasing annual giving from the graduates of the medical schools reflects their growing awareness of the financial problems of medical education.

NATIONAL FUND FOR MEDICAL EDUCATION

The accompanying resume has been submitted by the staff of the National Fund for Medical Education to acquaint readers with the current activities of the Fund in support of medical education.

The National Fund for Medical Education in January awarded grants totaling $3,078,825 to the nation's 82 accredited medical schools. This was the largest annual award in the Fund's history and brought to $15,743,766 the total distributed by the Fund since its first grants were made in 1951.

Each four-year school received $15,000 plus $65 per undergraduate medical student. The four two-year medical schools of the basic medical sciences received $7,500 each, plus $65 per student.

In addition, in May, the Fund made grants totaling $99,608 to 14 medical schools, under its special Class C Grants Program, to help American educators find ways to cope with teaching problems growing out of the rapid advancement of the medical sciences. These grants ranged in size from $2,471 to $14,500 and were given on a one-year basis.

The Fund's grants were made possible through the generosity of some 1,925 corporations, which contributed $2,050,757, as well as through a Ford Foundation Grant of $1,305,374, under its "matching" arrangement with the Fund.

In July, the Fund announced the establishment of a Medical Research Program, through which contributions from united funds, community chests, voluntary health agencies, and other organizations would be channeled into basic medical research. The program will aim to help support the continuing search for new medical knowledge, and to increase the number of trained medical researchers in the United States.

The United Community Funds and Councils of America, whose local affiliates have expressed a desire to help support broad fundamental programs of basic medical research on a national level, have already agreed to support this new research program. Negotiations have been started with various voluntary health agencies for their support of the program. This expansion of the Fund's program will in no way affect its present campaign among corporations to obtain support for the teaching budgets of the medical schools.

In October, 1958, the Fund joined with the American Medical Association and the Association of American Medical Colleges in presenting the sixth Frank H. Lahey Memorial Award to Frank Abrams, former chairman of the board, Standard Oil Company of New Jersey, and a leading philanthropist. The award is given annually to a layman for "distinguished service to medical education."

Previous recipients of the award were: President Dwight D. Eisenhower, former President Herbert Hoover, Dr. Abraham Flexner, Colby M. Chester, and Alfred P. Sloan Jr.

To celebrate the opening of Medical Education Week in April, the Fund joined with the American Medical Association and the Association of American Medical Colleges in awarding a scroll to Robert E. Wilson, retiring board chairman, Standard Oil Company of Indiana, and a founding trustee of the Fund. Dr. Stanhope Bayne-Jones was among those who paid tribute to Dr. Wilson and who helped to focus attention on the continuing need for industry to help support medical education nationally.

The Fund reports that it is continuing its campaign to alert American corporations to the problems of medical education. There are still many things that corporation executives do not understand, but the Fund feels that, with time, this will be overcome and American industry will fully realize its obligations to the medical sciences.

In April, the Fund published its 24-page annual report, "Medical Manpower for Tomorrow," showing the close link between medical education and national security. In this report, the Fund discussed the need for creative research, new goals for medicine, why medical education is expensive, and industry's stake in strong medical education.

It is the Fund's hope that during 1959 it will continue to forge ahead in its goal of bringing financial support to the medical schools.

STUDIES ON THE INTERNSHIP AND RESIDENCY ASPECTS OF MEDICAL EDUCATION

During recent years there has been an increasing interest on the part of medical education, specialty boards, organized medicine, hospital administrators, and licensing bodies in the field of graduate medical education. With a few outstanding exceptions, relatively little interest was manifested during the first decade of the current century in this field of education by others than the leading clinical teachers and the young physicians seeking additional experience.

In regard to an obvious need existing at the time, the Council on Medical Education of the American Medical Association began listing hospitals in which internship opportunities existed about 45 years ago. The Council took leadership in setting up certain basic standards or "Essentials" as minimal requirements for internship training in hospitals seeking approval for them. These basic standards have been under constant review and revision in an effort to align them appropriately with current knowledge and trends in any given period. Through the years the American Medical

Association has maintained a field and headquarters staff to evaluate these programs in terms of these "Essentials" and to assist those concerned with this phase of medical education in maintaining suitable opportunities for young physicians during their period of internship training.

As the trend toward specialization advanced, the American Medical Association, through its Council on Medical Education and Hospitals, in cooperation with representatives of the specialty fields, undertook the task of developing basic standards or "Essentials" for graduate education and training beyond the internship. These have been prepared primarily as guides to assist those developing such programs and also to furnish information to individuals seeking training. They outline the basic principles common to all residency education and training and also indicate certain requirements in the different areas of specialization. Programs of residency training have also been subject to study by the field staff of the Council prior to evaluation and accreditation. During recent years, Residency Review and Conference Committees representing both the Council and Specialty Boards have cooperatively reviewed and revised the "Essentials" in keeping with the changing scene. Furthermore, this cooperative function has extended to responsibility for approval of residency training programs, subsequently listed by the Council in the annual Internship and Residency number of THE JOURNAL. One of the important objectives of this liaison has been to foster, in residency education and training, opportunities for total training programs in single institutions or through appropriate affiliations so that individuals seeking specialty training may be assured of reasonable continuity and upgrading rather than fragmented, isolated, and inadequate segments of experience.

In 1940, the Commission on Graduate Medical Education,[26] under the chairmanship of Dr. Willard C. Rappleye, with Dr. Robin C. Buerki as Director of Study, presented a report after three years of study. This report clearly pointed out the objectives and basic principles of the internship, the residency, and postgraduate medical education on the basis of the knowledge and needs of that period. The need for constant study and reappraisal, intelligent experimentation, and flexibility of thought and actions is reemphasized throughout this report, most of which with minor modifications is pertinent to the current setting.

There have been numerous studies of the internship since the report of this Commission. Several of these have been precipitated by action of the House of Delegates of the American Medical Association. For some years the Association of American Medical Colleges has conducted studies through a Committee on Internships and currently has a Committee on Internships, Residencies and Graduate Medical Education. Some of these numerous studies have been thoroughly objective, such as the comprehensive analysis and report of the Advisory Committee on Internships to the Council on Medical Education and Hospitals which was presented in 1953. This analysis, as well as most of the special studies prior to and following the report of the Commission in 1940, have been brought about through problems arising from the service versus the educational aspects of the internship and from concern over intern distribution.

Through the activities of the Council on Medical Education and Hospitals, the American College of Surgeons, the American College of Physicians, the Specialty Boards, the Association of American Medical Colleges, and other interested organizations, it has been possible to maintain some semblance of order in graduate medical education out of what might otherwise have resulted in chaos equivalent to or worse than that existing in medical schools at the turn of the century. There are, today, no clean cut lines of division between the clinical clerkship of the final year in medical school, the internship, the residency, and even some aspects of postgraduate medical education. In many situations the same facilities and patients are being utilized, and the same faculty personnel may be engaged in all of these areas of medical education. Furthermore, advances in knowledge have been of such magnitude that the years of education in medical school no longer qualify the physician to enter practice but, instead, furnish the initial plateau upon which he erects the additional education and training needed prior to qualification for general practice or a specialty.

It is natural, therefore, that there has been aroused interest and concern on all sides regarding the graduate aspect of medical education today. This was evidenced by certain medical schools some years ago when they instituted the requirement of a year of internship prior to granting the degree of doctor of medicine. It was essential that such internships be approved by the medical schools granting the degrees so that their products could be assured of experiences as interns which were known to be desirable. This situation no longer exists and currently all approved schools grant their diplomas on completion of the final year of medical school. Concern over the merits of some of the available internships some years ago was evidenced when the Association of American Medical Colleges requested deans to prepare lists of hospitals in their respective areas where there was ample evidence that internship opportunities were well organized and adequately supervised. The exchange of such information undoubtedly assisted in the general upgrading of internship opportunities, but it was found to be not entirely satisfactory and was discontinued.

On June 10, 1958, the W. K. Kellogg Foundation announced a grant to the Association of American Medical Colleges adequate to underwrite a study of the internship as it is presently operated in medical school controlled hospitals. This study should assist in the analysis and clarification of some of the current problems associated with this initial phase of medical education beyond medical school. Has the internship become outmoded in the medical school teaching hospital where student clinical clerks, residents, fellows, and postgraduate students are also participating? Can the internship in such a setting represent the education and training experience which has been its traditional objective? Will the proposed minimum two-year program as preparation for general practice fit into the medical school controlled hospital programs and will it be considered as an extended internship or an internship-residency? What is the relationship of internships to future specialty training? Do straight internships actually provide adequate perspective or do they primarily serve the restricted service and/or educational functions of departments in which they are offered? Is the rotating internship still as desirable as it has been considered to be, and, if so, what constitutes a genuinely sound rotating experience? Has the point been reached where it may be desirable to discard traditional terminology and develop new descriptive words to encompass a better concept of basic education and training beyond medical school? Undoubtedly, this comprehensive study of medical school controlled hospital internships will cast interesting and helpful light on some of these questions.

Another interesting and challenging study is being conducted by the Division of Research in Professions of the Bureau of Applied Research of Columbia University. This comparative study of the internship and residency from the sociological point of view has been made possible by a grant from the Commonwealth Fund. Those who have developed this project believe there are many reasons why it is important to study the internship and residency as part of the total process of medical training. In other words the study will, it is hoped, indicate which types of internships reinforce and extend the training experiences of medical school and which counteract it. What kinds of hospitals place interns and residents in positions to be able to do what they are supposed to do in such matters as rounding out their range of clinical experience under competent supervision; learning through doing what they have not done sufficiently before; developing through practice what has been partially learned through precept; their role in the team responsible for comprehensive medical care; and becoming increasingly prepared to advance constantly their own competence and ultimately advance medical knowledge? What values of the young physician prove most vulnerable to "unfavorable environment" during the course of internship and residency experience; which prove most resistant to deterioration; what environments are conducive to retention and extensions of earlier learning and what are those which lead to contrary results? This study will also direct attention to a "contextual analysis" and will deal with relative merits of internships and residencies in large and small hospitals, degree of emphasis on team-work during training, and many other facets of sociological interest and importance in this type of evaluation of graduate medical education.

In this dynamic and rapidly changing scene these studies of the internship and residency are timely and challenging. There is much that must be done to determine how education beyond medical school can be made of greatest possible value in preparing the physician of today and tomorrow for the responsibilities he must assume in medical care. Along with this basic challenge is that of developing and fostering those individuals who are to be the leaders of tomorrow in teaching and research as well as in the provision of medical care. Every phase of graduate education must be reanalyzed and readjusted as time goes on so as to avoid over rigidity and too narrow restriction of knowledge and to maintain reasonable flexibility and perspective. Medical education has as its primary objective the responsibility of providing the environmental situation conducive to the development of competent physicians skilled in providing the best of medical care. With all due regard to the many other facets associated with the various aspects of medical education, this basic educational objective should always be kept in mind and graduate medical education offered which will best insure its attainment.

NATIONAL ACADEMY OF SCIENCES–NATIONAL RESEARCH COUNCIL STUDY: POSTDOCTORAL EDUCATION IN THE MEDICAL SCIENCES AND RESEARCH: A PRELIMINARY REPORT

Postdoctoral fellowship programs form an important part of medical education. The Division of Medical Sciences of the National Academy of Sciences—National Research Council have undertaken a study of such fellowship programs and their impact on medical education. Dr. Arthur S. Cain Jr., the director of this study, graciously provided this preliminary report of the study for inclusion in the Report on Medical Education in the United States and Canada.

> The medical curriculum . . . has reached the limits of its capacity: it can contain no more. . . . It is clear that educationally we have come almost to an *impasse*, that the load not only cannot be increased, but that for the sake of good teaching it must be lightened and simplified. The medical student . . . must have a timely opportunity to ground himself in fundamental studies, and to learn how to think, how to observe, how to apply. Every pedagogical consideration, there-

> fore, points to the conclusion that the elementary underlying sciences must be learned by the student of medicine . . . before he enrolls himself in the professional school.

So wrote Henry S. Pritchett in 1912, two years after Abraham Flexner[27] had surveyed the shocking state of American medical schools. There were those who disagreed with Pritchett's estimate of the importance of basic scientific studies to the student of medicine. Some said elementary basic scientific knowledge was superfluous; it was enough to learn professional medical techniques well without understanding their scientific basis or questioning their scientific validity. Others seemed to be saying, "We must understand well the scientific basis of what we do to improve and expand our knowledge, and thus improve our clinical abilities."

Pritchett continued:

> Very interesting statements have recently appeared in American educational journals, calling attention to the fact that students who lack this (scientific) preparation appear to have made quite as good showing in certain medical schools as those who have it. Without going too far into an analysis of the facts that are advanced in support of this contention, it needs to be said that even were this true, it is beside the mark. It still remains certain that the youth who has not pursued these fundamental sciences does in the medical school an entirely different thing from the one who has been properly trained in them. Teachers of medicine readily admit that for students who have really mastered their elementary physics and chemistry and biology, medical education becomes a wholly different thing from what it is for those who have not gained that foundation, not only because the man so trained can begin at a different point, but also because he is familiar with scientific concepts, scientific nomenclature, and scientific methods of reasoning.

All were agreed that the medical curriculum in 1912 could hold no more, nor could the human brain assimilate rapidly accumulating knowledge. Nevertheless, curricula were expanded, premedical scientific studies were prescribed, and the basic sciences became an increasingly important part of medical education.

Today, the struggle for adequate insight and proficiency in the basic sciences of medicine seems at its zenith. The variety of scientific disciplines contributing to medical knowledge now extends into areas of physical and biological science not long ago little used by medical scientists. Clinical investigation has shifted from what was once called (by some) "applied" research to research of a very fundamental kind. Doctors of medicine and doctors of philosophy, especially those headed for careers in academic medicine and research but also increasing numbers of physicians who will make their careers in medical practice, seek ways to gain advanced basic scientific proficiency as an essential tool for productive careers. Through modern "fellowships," many of them find the way.

Fellowships in the medical sciences were born of the readjustments and turmoil of the first Flexner report (1910) and the need of medical school faculties for stronger basic scientific foundations. In 1921, when most of the proprietary medical schools had closed and medicine was finally within the universities, the Division of Medical Sciences of the National Academy of Sciences–National Research Council proposed that fellowships in the medical sciences be offered in national competition. The first such fellowships were soon established by the division and supported financially by the Rockefeller Foundation. That support has been continuous since the inception of the fellowships.

Those first fellowships gave young medical scientists an opportunity to improve their basic scientific backgrounds and sought to influence them toward careers in teaching and research. The popularity and success of the fellowships can be seen in the many such fellowships offered today.

In 1956, Dr. R. Keith Cannan, chairman of the Division of Medical Sciences, National Academy of Sciences–National Research Council, called attention to the variety and number of available fellowship opportunities and the rapid changes taking place in medical education and research. He proposed a study of postdoctoral fellowship rograms to determine their appropriateness to the developing needs.[28] As a result, the present survey of fellowships and similar training schemes, together with their impact on medical education and the medical schools, was undertaken. The financial support of the John and Mary R. Markle Foundation made the survey possible. The active cooperation of the Council on Medical Education and Hospitals of the American Medical Association and of the Association of American Medical Colleges has provided valuable assistance, and the National Institutes of Health, through a recent grant, aided in the rapid analysis of data by punch card methods.

Mrs. Lois G. Bowen, Professional Assistant of the Academy-Research Council and for some years responsible for the administration of the medical fellowship programs of the Academy-Research Council, has worked closely with the Director of the Survey from the beginning. The checking and preparation of thousands of questionnaires for analysis has been a complex problem for Mrs. Bowen and her assistants.

For the purpose of this survey, a fellowship is defined as financial support awarded to a doctor of medicine, doctor of philosophy, or scientist of equivalent education for full-time advanced study and training in basic medical sciences and research. The awards, with very few exceptions, are for a period of at least one year. The "junior postdoctoral research fellowship" is awarded to young scientists not yet established in a career and in need of more thorough training and experience in basic science and research methods. "Senior" and "advanced" fellowships are awarded to established medical scientists chiefly for concentrated research and study, usually for a period of three to five years. Occasionally, in the case of some senior scientists, they are awarded for shorter periods. Most junior fellowships exclude more than minimal teaching and clinical responsibilities. The fellowships studied in this survey were awarded in national competition. There are also other fellowships awarded by local agencies and institutions. These latter are not included in this report but will be discussed to a certain extent in the final report.

Table 3.—*Distribution of Applications and Awards of Fellowships by Doctoral Degrees*

Type of Fellowship Sought	Successful Applicants			Unsuccessful Applicants*			
	M.D.	Ph.D.	M.D. and Ph.D. held	M.D.	Ph.D.	M.D. and Ph.D. held	Totals
Junior postdoctoral	402	352	11	166	174	6	1,111
Senior or advanced	71	70	8	32	23	9	213
Either type (double application, would accept either award)	14	17	0	4	5	1	41
Totals	487	439	19	202	202	16	1,365
Double applicants (would accept either award)							
Received junior award	12	10	0	...	...	...	22
Received senior award	2	7	0	...	...	...	9

* Includes a few candidates who withdrew their applications prior to consideration.

Scope of the Survey

The survey was divided into six areas.

1. Opportunities for advanced training and experience in medical sciences and research available through the postdoctoral fellowships offered by more than twenty-two national agencies were studied. The purpose and regulations of these fellowship programs were analyzed to determine, insofar as possible, the kind and number available at junior, senior, and intermediate levels. Emphasis by the various agencies on specific scientific disciplines or disease categories and restrictions on the assumption of general academic responsibilities during the fellowship were also reviewed.

2. All applications submitted by doctors of medicine and doctors of philosophy for these fellowships during one test year (1955-1956) were analyzed. The curriculum vitae of each applicant, his area of research interest, and future career plans were included in material abstracted for study.

3. The chairmen of each of 11 departments of the United States medical schools were consulted by questionnaire for estimates of the balance between teaching and research in their respective departments and the supply and quality of applicants for budgeted vacancies on department staffs. The chairmen were also asked to complete tables giving educational background (by academic degree), postdoctoral [illegible] and information on financial support of department staff members. Similar information was also requested about postdoctoral fellows currently in the departments.

4. All current and past fellows of the 22 national agencies studied in parts 1 and 2 were consulted by questionnaire concerning their fellowship experience, present positions, plans for the future, attitudes toward academic and research careers, and clinical experience. Comments and suggestions were invited. Three questionnaires were used—one to all alumni of the 22 fellowship programs since 1945, plus all who held fellowships in 1939-1940; a second questionnaire to all 1957-1958 junior postdoctoral fellows; and a third to all 1957-1958 senior and long-term fellows. The three questionnaires were similar but altered to make them appropriate for their respective recipients.

5. All 1957-1958 interns and residents in primary teaching hospitals of every United States medical school were sent questionnaires. The questionnaires sought career interests, attitudes toward academic careers, research, private practice, and the nature and amount of additional study and training they deemed necessary. An evaluation of available training and fellowship opportunities and their estimates of the obstacles to acquiring additional training was also sought.

6. Finally, full-time members of all departments of anatomy, microbiology, biochemistry, pharmacology, physiology, medicine, and surgery were sent questionnaires. They were asked about academic responsibilities, especially teaching, research, and administrative loads. Educational backgrounds (by academic degrees, clinical training, and fellowship experience), sources of financial support, and other information was also requested. Additional departments will be included in this part of the survey.

Results

The results presented are selected for their appropriateness to this education number of The Journal.

One thousand three hundred and sixty-five doctors of medicine and doctors of philosophy submitted applications for junior or advanced fellowships in the medical sciences to one or more of the national agencies surveyed. Their applications were filed in 1955 and 1956 for fellowships the first year of which would terminate on or before Dec. 31, 1957. There were 48 more M.D.'s than Ph.D.'s among the applicants, and 35 applicants held both degrees. More than two-thirds of the applicants were awarded fellowships. The ratio between M.D.'s and Ph.D.'s in the successful group was approximately the same as in the whole group of applicants. A few applicants applied for both junior and senior awards, leaving the decision as to which

Table 4.—*Distribution of Incumbent 1957-1958 Fellows by Doctoral Degrees*

	Fellows, No.	M.D.'s	Ph.D.'s	Sc.D.'s	Two or More Doctorates Held
1957-1958 Junior fellows	463	262	207	3	9
1957-1958 Senior fellows	289	195	117	3	26
Past fellows					
1946-1956 incl., and 1939-1940	2709	1760	1122	34	207

was appropriate to the selection boards. Table 3 shows the distribution of applicants by degrees held, awards sought, and awards received.

Three thousand nine hundred and eighty-nine present and past fellows of the national agencies surveyed were sent questionnaires. These included all fellows since 1945, plus those who had awards in 1939-1940, and all 1957-1958 fellows. The 1957-1958 fellows are referred to as "present" fellows. Three thousand four hundred and seventy-four, or 87.1%, completed and returned their questionnaires. Of these, 3,461 questionnaires were coded and studied by punch card methods. Two thousand seven hundred and nine past fellows, 463 present junior fellows, and 289 present senior fellows were included. The distribution of M.D.'s, Ph.D.'s, and Sc.D.'s is shown in table 4.

All fellows, present and past, were asked to give their choice of careers without consideration of the economic rewards and then to give their choice under the realities of present day economics. The majority in all groups preferred a full-time salaried academic career if economic conditions could be disregarded, but approximately a third of these shied away from full-time salaried academic post's under the economic realities of academic life. Table 5 indicates the career choices of present and past fellows under conditions as they exist today and under conditions in which economic rewards would not be a deciding factor.

Table 5.—*Career Interests of Fellows*

Career Choice	Past Fellows		1957-1958 Present Junior Fellows		1957-1958 Present Senior Fellows	
	If economic rewards were equal	Under present economic conditions	If economic rewards were equal	Under present economic conditions	If economic rewards were equal	Under present economic conditions
1. Full-time academic post with good balance between teaching, research, and administrative duties	1,710	1,120	324	253	234	178
2. Full-time research with no other responsibilities	575	414	87	66	39	27
3. Clinical investigation and medical practice in a full-time academic position	545	530	75	96	37	54
4. Full-time private medical practice	71	344	9	33	Not requested	

Note: There are a few double choices included in the above figures. They usually represented indecision between numbers 1 and 2.

One thousand five hundred and fifteen past fellows were found to be in full or part-time academic positions. There were 226 professors, 125 associate professors, 571 assistant professors, and 194 instructors in this group. Five hundred and forty-nine were research associates and assistants or held other university titles. One thousand two hundred and nine past fellows were not in full-time academic posts, but 419 of these had held such positions in the past, while 790 had never held full-time academic jobs. All past fellows who did not hold full-time university positions at the time the questionnaires were completed were asked if they would accept such a position if assured of a suitable balance between teaching, research and administrative responsibilities in their work. Only 192 indicated that they would not. The faculty ranks for which those who said they would consider full-time academic careers thought themselves qualified are shown in table 6 and the minimum salary ranges they would accept are shown in table 7. The rank and salary expectations of present fellows are also shown in tables 6 and 7.

Table 6.—*Estimate of Their Faculty Rank Qualifications by Fellows Who Would Accept Full-time Academic Positions Under Suitable Work Arrangements*

	Past Fellows	1957-1958 Junior Fellows	1957-1958 Senior Fellows
Professor	217	7	73
Associate professor	456	35	147
Assistant professor	637	265	72
Instructor	148	175	7

Note: In some cases there was indecision between two ranks, usually at junior levels, and there is a small number of double choices included.

One thousand and eighty-five past fellows had no teaching experience in their fellowships, and an additional 1,216 had very little. Only 392 indicated significant teaching activities as fellows. Six hundred and fifty-nine who had had little or no teaching experience considered this a disadvantage and thought that fellowships should include teaching experience, but 981 disagreed with them. Present junior and advanced fellows who were engaged in at least some teaching in their fellowships considered the experience beneficial by more than ten to one.

The value of clinical training to the fellow concentrating on basic science and research experience has long been disputed by various segments of the medical fraternity. It is interesting to note that only 49 physicians among the past fellows have not served an internship, and most of them have spent at least one year in a residency. Almost half of the physicians among the past fellows are diplomates of medical specialty boards, and a majority of those who are not diplomates intend to seek certification.

Table 7.—*Minimum Salary Ranges Acceptable to Fellows Who Would Accept Full-time Academic Posts*

Range	Past Fellows	1957-1958 Junior Fellows	1957-1958 Senior Fellows
$6,000 or less	120	179	12
$6,000 to $8,000	297	174	51
$8,000 to $10,000	312	64	88
$10,000 to $12,000	148	13	48
$12,000 to $15,000	169	7	45
Over $15,000	127	0	14

Among present fellows, 22 physicians had not served internships and 72 had had no residency training. In table 8 the clinical training and specialty board status of present and past fellows is shown.

Table 8.—*Clinical Backgrounds and Specialty Board Status of Present and Past Fellows Who Hold the M.D. Degree*

	Past Fellows		1957-1958 Junior Fellows		1957-1958 Senior Fellows	
	Yes	No	Yes	No	Yes	No
Served internship	1,706	49	251	11	184	11
Served residency	1,541	203	217	45	166	27
Certified by a medical specialty board	845	903	23	239	88	105
Intends to seek certification	587	206	195	35	59	45

Two-thirds of the past fellows who had had internships or residencies thought that their clinical training had helped them profit from their fellowships. The clinical training, they indicated, had been beneficial to them in planning, conducting, and interpreting their research. Their comments often suggested that clinical training had made possible a clear idea of their research interests and the depth and breadth of basic scientific studies necessary for adequate pursuit of these interests.

Nine thousand four hundred and thirty interns and residents in the primary teaching hospitals of all United States medical schools received questionnaires, and 7,422, or 78.7%, responded. Of those responding, approximately 884 were graduates of foreign schools, and they will be considered separately in the final report of the survey.

Alternate questionnaires from graduates of United States medical schools (half of those returned, or 3,269) were coded and analyzed by punch card methods. The incoming questionnaires were filed so that half of the returns from each hospital were included in the total. Eight hundred and eighty-nine interns, 2,305 residents, and 75 clinical trainees were represented in this sample. The data here presented are taken from this 50% sample and reported in terms of numbers and percentages of 3,269. The questionnaires not analyzed by machine methods are being studied for comments and suggestions and included in the final report.

Table 9.—*Specialty Board Aspirations of Interns and Residents*

Specialty Certification to be Sought	Number
Medicine	682
Surgery	458
Obstetrics and gynecology	309
Pediatrics	285
Psychiatry and neurology	268
Radiology	164
Orthopedic surgery	156
Pathology	149
Ophthalmology	113
Anesthesiology	98
Urology	82
Thoracic surgery	65
Neurological surgery	61
Dermatology and syphilology	50
Otolaryngology	30
Plastic surgery	28
Physical medicine and rehabilitation	11
Proctology	2
Preventive medicine	1

Twenty-seven of the interns and residents held Ph.D. degrees, twelve the Sc.D., and 146 the Master's degree.

The interest of these interns and residents in advanced training in special clinical areas, advanced basic scientific study, and research training beyond any they had had, and teaching, was abundantly expressed in their responses. Only a handful, 105 out of 3,269, said they did not want to seek specialty board certification. Medicine and surgery, respectively, were the first two specialty choices. Obstetrics and gynecology, pediatrics, and psychiatry and neurology followed in that order (table 9). Only a few, 85, were undecided about specialty board certification.

Approximately two-thirds of the interns and residents wanted additional training in research regardless of their future career plans. Some preferred to gain this experience concurrently or intermittently with residency training, if possible. Others wanted fellowships and traineeships, and some were undecided as to the best method (table 10). Six hundred and thirty-six interns and residents planning careers essentially in private practice planned to engage in research along with their practices.

Table 10.—*Preferred Mode of Research Training*

	Number
Concurrent with residency	844
Intermittently with residency	856
Full-time research fellowship	324
Clinical traineeship	444

Only 245 in the intern-resident group, or 7.2%, indicated that they did not want to participate in teaching or research once they entered upon their careers, while 1,898 who plan careers essentially in private medical practice want to make teaching a part of their careers. In addition, 810, or 24.7%, want careers in full-time or essentially full-time academic positions. Almost a third of these (252) prefer full-time salaried positions and the rest "geographical" full-time. Only 33 interns and residents preferred full-time positions in a basic science department or a research institute.

Asked to evaluate some aspects of research fellowships and clinical traineeships, the interns and residents looked with disfavor by approximately four to one on regulations which exclude opportunities to maintain clinical proficiency during fellowship or traineeship. The exclusion of teaching opportunities was regarded with approximately the same disapproval.

Dissatisfaction with the breadth and depth of their basic scientific backgrounds was stated repeatedly in comments by the interns and residents, regardless of whether they were headed for academic careers or private practice. In answer to specific questions and in appended discussions of the subject, they expressed a desire and often a determination to understand and use the concepts and research methods of the basic sciences, physical as well as biological, in their future work. Statistical data on this subject and an analysis of the comments will be a part of the final report of the survey.

The final report from the survey from which this preliminary report is drawn will be made to the Medical Fellowship Board of the Division of Medical Sciences, National Academy of Sciences–National Research Council. The Board, under the chairmanship of Dr. Sam L. Clark, Vanderbilt University, has participated actively in the conduct of the survey, and the final report will provide a basis for the Board's recommendations to the Division on future postdoctoral fellowship activities.

REPORT OF THE SECRETARY'S CONSULTANTS ON THE ADVANCEMENT OF MEDICAL RESEARCH AND EDUCATION THROUGH THE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

On July 14, 1958, Secretary Marion B. Folsom released as a public document, the final report of the Secretary's Consultants on Medical Research and Education, entitled "The Advancement of Medical Research and Education Through The Department of Health, Education, and Welfare." Dr. Stanhope Bayne-Jones, formerly dean of Yale University School of Medicine, president of the Joint Administrative Board of the New York Hospital-Cornell Medical Center, and technical director of research, Office of the Surgeon General, Department of the Army, chaired the group of 10 prominent medical educators and industry research executives who participated in the study.*

When the consultants were appointed, Secretary Folsom indicated that among the reasons for this action were (*a*) the recent very rapid and large expansion of the medical research programs of the Department of Health, Education, and Welfare and (*b*) his concern that the medical research effort, which had contributed substantially to the health of the American people, should continue to make a maximum contribution based on wise policies, sound administration, and a competent scientific staff. The consultants were expected to look into such matters as (*a*) the activities of the Department of Health, Education, and Welfare in the fields of medical research and education, (*b*) the situation (state and needs) of medical research and education in the country as a whole, (*c*) the impact of the expanding research programs on medical education, (*d*) the availability of scientists, technicians, and facilities, (*e*) the relative emphasis given to research in the various disease fields, (*f*) the relative emphasis given to fundamental studies in the basic sciences generally, (*g*) the standards for approval of research projects, and (*h*) the relationship between federal and private research programs.

This study originally was designed to cover a two-year period, but at the request of the Secretary was shortened so that it might be submitted prior to his withdrawal from the Department of Health, Education, and Welfare in the summer of 1958. The report indicates that all of the consultants felt privileged to undertake this important assignment and that they were pleased to be able to give the Secretary their mature judgment on the matters with which they dealt. Secretary Folsom indicated his appreciation of the task commenting in the preparatory note that they had "performed their public service with distinction." He, furthermore, stated that the report was being made available as a public document in the belief that it will be of interest "not only to all those concerned with medical education and research, but those interested in the determination of policies and plans for research."

The report indicated the consultants believed that "expenditures for medical research in this country can and should be tripled to reach a billion dollars annually by 1970." To develop a medical research effort of this magnitude will necessitate an augmentation in the number of physicians and other scientists engaged in medical research from the current 20,000 to 45,000 by that date. The consultants indicated that funds for construction of medical schools will be needed "on a much larger scale than has heretofore been contemplated" and that even if large funds are provided "it seems certain that the number of physicians per 100,000 population will decline during the next 12 years." The report also states that "the expansion of medical research and education required in the national interest will be costly and should not be restricted by lack of funds." In 1957, for instance, total national medical research expenditures approximated

---

* In addition to Dr. Bayne-Jones, the special consultants were George Packer Berry, M.D., Dean, Harvard Medical School, Boston, Mass.; Thomas P. Carney, Ph.D., Vice-president, Research Development and Control, Eli Lilly and Company, Indianapolis, Ind.; Lowell T. Coggeshall, M.D., Dean, Division of Biological Sciences, University of Chicago, Chicago; Fred Carrington Cole, Ph.D., Academic Vice-president, Tulane University, New Orleans; Samuel Lenher, Ph.D., Vice-president, E. I. duPont de Nemours and Company, Wilmington, Del.; Irvine H. Page, M.D., Director of Research, Cleveland Clinic Foundation, Cleveland; Robert C. Swain, Ph.D., Vice-president in Charge of Research and Development, American Cyanamid Company, New York; Stafford L. Warren, M.D., Dean, School of Medicine, University of California Medical Center, Los Angeles; James Edwin Webb, President, Republic Supply Company, and President, Frontiers of Science Foundation of Oklahoma, Oklahoma City, former Director of the Bureau of Budget, and former Under-Secretary of State.

330 million dollars in comparison to the 900 million to 1 billion dollars which the consultants consider a conservative projection for 1970.

The consultants expressed the belief that the public interest would not be served if the ratio of physicians per 100,000 population falls below 132, which has been a relative constant during the past 30 years. To maintain this approximate ratio it is pointed out that from 14 to 20 average size medical schools should be developed to meet the needs of 1970 and that these will cost between 500 million and 1 billion dollars. Since there is a lag of approximately 10 years between the planning of a new school and the graduation of its first class, the consultants indicate that there will almost inevitably be a decline in the number of physicians per 100,000 between the present time and 1970.

The report states, "Unless there is a marked change in social philosophy leading to private gifts or state appropriations on an unprecedented scale, large federal appropriations will be required."

In discussing the support of medical research, the report suggests that the federal government should continue to provide about half of the funds needed so that by 1970 federal expenditures should increase from 186 to 500 million dollars. Last year industry contributed an estimated 90 million, private philanthropy 35 million, and endowment income approximately 19 million dollars. The committee projected for 1970 annual expenditures of over 300 million dollars from industry and over 100 million from private philanthropy.

The report covered many other areas, including an analysis of both physicians and Ph.D. potential additions in the field of medical research, the role of the Public Health Service and, particularly, the operations of the National Institutes of Health in this field.

This report should be carefully read and analyzed by thoughtful individuals, as the recommendations carry significant implications and challenges. As has been repeatedly pointed out in this and previous education numbers of The Journal, the present rapidly changing scene is beset with unknowns of many kinds. There are augmented needs in every area to meet the increased challenges of the growing population and the socioeconomic as well as scientific advances. These are not the type of challenges that can be successfully met with a "crash program" but rather necessitate sound, intelligent consideration. This study clearly implies the need for such objective analysis. Large financial resources, in themselves, carry no guarantee of solving these problems. Adequate financing makes the potentialities of any given situation better, providing they are realistic and attainable. The question can logically be posed as to whether all new medical schools in the future should be developed as elaborate research institutes or whether there is not a place for additional schools where the major focus is on sound education and more modest emphasis on research. Both educational and research aspects are vital to all institutions conducting medical education, but unless reasonable balance is maintained in planning for the future, the educational function of the medical school may be jeopardized through overemphasis on research alone.

PROGRESS REPORT SUBMITTED BY COMMITTEE ON PREPARATION FOR GENERAL PRACTICE

After a year and a half of study, the Committee on Preparation for General Practice on May 20, 1958, submitted a Progress Report to its three parent organizations, the American Medical Association, the Association of American Medical Colleges, and the American Academy of General Practice. The Board of Trustees of the American Medical Association subsequently presented the Progress Report as Supplement A in its report to the House of Delegates at their June (1958) meeting in San Francisco. In submitting this Progress Report the Committee expressed the hope that it would be carefully read and evaluated by all concerned and that any criticisms or suggestions be submitted to it for consideration prior to the preparation of a more definite final statement. The complete text of the report has been published in the Sept. 6, 1958, issue of The Journal as part of the Proceedings of the San Francisco Session and is referred to the attention of those who wish to review the complete text.

The report of this Committee merits serious study on the part of those interested in and concerned with basic or graduate medical education, specialty education and training, and licensure. After reviewing all aspects of current preparation beyond medical school, the Committee expresses the opinion that:

> The remarkable advances in medicine that have occurred and that will continue to occur have increased the difficulty and the complexity of general practice as well as of other specialty practices. The responsibility of the general practitioner is a heavy one. It demands knowledge, alertness, agility of mind, and a wisdom born of education and experience. It necessitates the possession of a sound knowledge of the fundamentals of medicine as well as a synoptic knowledge of the basic principles of special fields. In view of this, as well as the pattern that has been followed successfully in the specialty fields of developing graduate educational programs beyond medical school, the Committee recommends that a new graduate educational program for general practice be developed.

The proposed program constituting the final portions of the Progress Report is presented because of its inherent challenges to medical education and particularly to those who are endeavoring to offer graduate education and training in the field of general practice in keeping with current knowledge and needs.

The Proposed Program

In recommending a new graduate program for the general practice of medicine, the Committee believes that *primary* consideration should be given to an educational experience enabling the physician to provide medical care for all members of the family irrespective of age. After determining that the period beginning at the time of receiving the M.D. degree is the most appropriate one for a new plan of preparation for general practice, the Committee agreed to concern itself with a minimal program. It was considered best at the outset to avoid being compromised by programs presently in existence or by current limitations imposed by statutes or military obligations. This proposed program is designed to replace for future general practitioners, the current internship as well as existing residency programs in general practice.

The internship year as presently constituted cannot be considered as a component of this program for it would result in dividing it into two separate segments. The internship was designed many years ago to provide the initial contact with and responsibility for patients. Since the development of the clinical clerkship, it no longer comprises such initial patient contact but rather it is now considered as one of several graded steps toward the assumption of total responsibility for patient care. Further, there is now general agreement that the one-year internship alone is inadequate as preparation for the practice of medicine. The Committee believes the one-year internship encourages inadequate preparation for general practice.

The present values of the internship will be an inherent part of the proposed program, but cannot be separated out of it as a segment without weakening the greater values to be derived from dealing with the new program as a unified whole. The graduate program proposed as preparation for general practice is designed to be more comprehensive than the internship in regard to patient responsibility, educational content, and continuity of experience.

Under the existing circumstances, it is believed that a period of at least two years of formal hospital training following attainment of the medical degree is necessary in preparation for the general practice of medicine. However, time alone cannot serve as a valid measure of educational adequacy. *The two-year period would be minimal even where the other factors of educational quality and content are optimal.*

The graduate program of two years in preparation for general practice should be planned and implemented as a unified whole. Since the general practitioner is to provide continuing care, it is highly important that the preparation for this kind of practice be designed to assure every possible opportunity for the participant to study patients over relatively long periods of time. He should follow the patient, as necessary, in the outpatient service, when indicated in the home, and certainly from one hospital service to another. There should be a maximum continuity of assignment to specific services so that the program will stress education through continuing rather than episodic medical experience. Such a unified two-year program will permit and encourage the necessary progression of responsibility and content.

This two-year program should include a basic eighteen month period to provide experience in the diagnostic, therapeutic, psychiatric, preventive and rehabilitative aspects of internal medicine and pediatrics in a very broad sense. In addition to the basic period, the opportunity for training in obstetrics should be a requisite for all programs. Participants who plan to practice obstetrics are encouraged to spend the major portion of an elective six months in obstetrical training. For those who do not anticipate an obstetrical practice, the six month elective should be utilized for further training in other segments of the program. It is urged that the concept of unity be applied to the elective period to prevent unduly short assignments that would provide little educational justification.

Throughout the two-year program, the trainee should have experience provided by regularly assigned periods of emergency room service. The Committee believes that this should include training in the emergency and primary management of trauma and in minor surgery. (The working definition of the latter is that minor surgical procedures are those which in themselves have no expected mortality, require no medical assistants and, in suitable circumstances, may be performed satisfactorily outside the hospital.)

Because the care of the ambulatory patient is an important part of medical practice, provision of adequate opportunities for the study of outpatients is essential. This should constitute a part of the basic eighteen month period and may well continue through the other six months. It should include experience in medical or diagnostic gynecology.

Experience in the care of the new-born infant is considered an essential portion of the program.

The proposed two-year program should assure the opportunity for adequate preparation of the physician to provide medical care to all members of the family. Any physician planning to undertake obstetrics other than uncomplicated obstetrics, or surgery other than minor surgery, should have additional adequate training.

The Committee believes that such a two-year experience would furnish a sound base for further graduate medical education in any field. The Committee therefore recognizes that the thoughtful cooperation of specialty groups will be required to implement a sound program for preparation for the general practice of medicine.

This report outlines the minimal program under optimal circumstances. There will be those physicians who will elect further graduate education and such should be encouraged.

Finally, the general practitioner, like all other physicians, will be expected to pursue a continuing program of postgraduate medical education.

The Committee envisages certain further studies as required for the completion of its assignments. In view of the thoughtful cooperation of specialty groups needed for successful implementation of the proposed program, the Committee is holding formal consultations with such specialty groups as an essential preliminary to the more specific and detailed planning of the proposed minimal program. It expects to include consideration as to whether this program of preparation for general practice should be called an internship or a residency, or identified in some other manner. The Committee, in cooperation with the specialty groups involved, will give consideration to the type of recognition that may be developed for those individuals who successfully complete a part or all of this proposed program.

SECOND WORLD CONFERENCE ON MEDICAL EDUCATION

Planning has progressed satisfactorily to date for the Second World Conference on Medical Education, scheduled to be held in Chicago, Aug. 30 to Sept. 4, 1959. The general theme of this program, "Medicine—A Lifelong Study," will deal with the challenges of education beyond completion of basic medical studies. Since the first World Conference (London, 1953) was centered around consideration of the area of basic medical education, this projected conference will afford the opportunity to conduct similar exchange of viewpoints on problems and challenges associated with medical education beyond this level.

The Second World Conference will follow the general format which proved so eminently satisfactory at the London Conference in the use of initial and final plenary sessions with a series of four half-day interim panels. The panel sessions will devote considerations to (*a*) basic clinical training for all doctors, (*b*) advanced education for general and specialty practice, (*c*) the development of teachers and investigators, and (*d*) continuing medical education.

Arrangements are being made for preconference and postconference tours so that visiting medical educators from abroad may visit medical teaching centers. The initial response relative to participation on the part of outstanding foreign medical educators has been most gratifying and it is hoped that there will be a large attendance of American educators actively participating in making this a valuable and mutually stimulating experience for all. Those planning to attend should make their hotel reservations in Chicago well in advance. Headquarters will be at the Palmer House.

INITIAL TEST OF COOPERATIVE ANALYSIS OF PROBLEMS OF MUTUAL CONCERN LEADS TO PROPOSAL FOR PERMANENT LIAISON BETWEEN HIGHER EDUCATION AND ORGANIZED MEDICINE

In the 1955-1956 Annual Report on Medical Education in the United States and Canada[29] the "Conclusions and Recommendations of the Council on Medical Service Related to Private Practice by Medical School Faculty Members" was reported in detail. One of the recommendations was to the effect "that on request of a medical society and a medical school, the American Medical Association Board of Trustees establish, in cooperation with the Association of American Medical Colleges, a special committee whose function would be to investigate areas where there is friction between the medical school and the profession. Such a committee might (1) assure the continuation of liaison, (2) see to it that all data and facts are made available to all concerned, and (3) seek to resolve difference of opinion."

During April, 1958 occasion arose to utilize this mechanism as a result of a written request to the Board of Trustees from the president of the Medical College of Georgia, the president of the Richmond County Medical Society and the Council of the Medical Association of Georgia, together with the approval of the Chancellor of the Board of Regents of the University of Georgia. The Committee was appointed to study and mediate differences of opinion among doctors in Georgia regarding the policies of the Medical College of Georgia and its teaching hospital, the Eugene Talmadge Memorial Hospital. The Committee was appointed in cooperation with the Association of American Medical Colleges and consisted of seven physicians together with a staff member from the Law Department of the American Medical Association. The Committee spent three days on location analyzing the background of the problem, meeting with members of the local and state societies, the medical college and the Board of Regents of the University System, first individually, and finally collectively. After thorough discussion, oral agreement was reached in regard to four major areas of concern. This was then reduced to writing and subsequently signed by the presidents of the local medical society, the Medical Association of Georgia, the Medical College of Georgia, and the Chancellor of the Board of Regents of the University System.

The value of cooperation of this type in the objective analysis of the difficulties and misunderstandings which arise on occasion between medical schools and the profession has been clearly illustrated in this first instance of the application of the 1956 recommendation. The need for better liaison between higher education, representing the parent universities of which medical schools form components, and organized medicine has been apparent to many thoughtful individuals for some time and was also clearly highlighted in the Georgia situation.

Subsequent considerations have led to the proposal that it would be highly advantageous to all concerned to establish a "top-level" liaison between higher education and organized medicine to consider some of the mutual areas of concern that lie ahead. It has been proposed that this "top-level" liaison committee, to which reference has been made earlier in this report, consist of a representative from the presidents of universities in which medical schools exist, one from medical schools without university affiliation, two from the Association of American Medical Colleges, two from the Board of Trustees of the American Medical Association, and two from the Council on Medical Education and Hospitals, with staff representation from the latter three groups. It is anticipated that this committee will consider problems having mutual impact on medical education and medical practice such as the rapidly growing programs of prepayment for medical care, the increasing need for full-time faculty personnel to conduct teaching and research, and the ways and means where difficulties and/or misunderstanding created by the changing situations may be avoided or resolved. Such cooperative liaison carries great potential for avoiding in the future some of the difficulties which might have been obviated through more adequate objective intercommunications in the past.

REGIONAL INTERSTATE COMPACTS AND MEDICAL EDUCATION

The following resumes of the interest and activities of the Southern Regional Education Board, the Western Interstate Commission for Higher Education, and the New England Board of Higher Education were submitted for inclusion in this education issue of THE JOURNAL *to summarize the current status of these programs in the field of medical education.*

Southern Regional Education Board (SREB) and Medical Education

Over the past 10 years, the SREB program has had considerable effect on medical education in the 16 Southern states. Its impact is reflected both in the numbers of students and the amounts of money (table 11) that have crossed state lines under regional contracts since the beginning of the nation's first regional education compact.

Represented in these figures are significant benefits to states and institutions:

1. States which until quite recently did not have public medical schools assured medical training for sizable numbers of their citizens during a time when competition for admission was great.
2. Medical schools accepting contract students have received new money not available before the contracts, money which supplemented funds obtained from usual sources. Emory University School of Medicine, for example, has received to date some $775,000 under medical contracts, making it possible for Emory to avoid retrenching its instructional program during a period when it was reorganizing its medical school finances.
3. Meharry Medical College has received sufficient funds from the contracts to make it possible for it to continue medical training for many Negro students who might not otherwise have had an opportunity to enter medicine.
4. In some instances, the contracts have broadened the geographical area from which students were selected, with increase in quality of students.

As new medical schools were built during the past few years, the number of students under the contracts in medicine has diminished. If states use regional contracts solely to reserve spaces in out-of-state schools, the contracts will have limited use, since they do not provide capital funds for expanding the capacity of medical schools. However, some states with only one medical school eventually will be unable to meet student demands or needs for graduates. Expansion of some schools for interstate use will both save money and improve quality of training. Such selective expansion will be easier if the expanding schools have assurance that they will receive funds from contracts over a period of time in exchange for admission of quotas of students from other states. States will probably not be willing to contribute to capital costs of expansion, though the same effect can be achieved by setting the payments under contracts at figures which are high enough to cover instructional costs and amortization.

At the request of the Southern Governors' Conferences in 1954, SREB established a regional program to increase training and research in mental health fields, including psychiatry as well as other professions. The program, guided by a council composed of commissioners of mental health, professors of psychiatry, and other groups, has stimulated states to put more money into training and research, and has wrestled with reducing the personnel shortages which plague mental hospitals and clinics by encouraging more students to enter the mental health fields.

It has also been suggested that SREB study the possibility of using contracts (1) to stimulate expanded programs of postgraduate work in medicine and (2) as a means by which medical schools could increase quality of students through widening the geographic origin of student bodies. Neither of these two suggestions, however, has thus far gained widespread support among either medical educators or state officials.

Western Interstate Commission for Higher Education

The Western Interstate Commission for Higher Education (WICHE) is a regional education agency, organized and financed by 11 western states (Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, Washington, Wyoming, and Alaska). The commission was set up by an interstate compact in 1950, at the initiative of the Western governors. WICHE is a fact-finding agency and a clearing house for ideas and proposals of interstate concern. Its task is to promote interstate approaches in higher education, particularly in the health sciences.

Table 11.—*Southern Regional Education Board (SREB) and Medical Education*

	Students, No.	Amount of Money Paid by States
1949-1950	174	$240,000
1950-1951	245	372,000
1951-1952	335	492,000
1952-1953	380	569,000
1953-1954	357	528,000
1954-1955	353	540,000
1955-1956	347	520,000
1956-1957	302	457,000
1957-1958	245	362,500
1958-1959 (estimated)	194	387,333

Medicine is a high priority item in the program of the commission. WICHE serves as a clearing house for a program whereby students from states without medical schools may attend medical schools in the area of the Western compact. Under this program, 85 medical students are crossing state borders this year to attend western medical schools. The student pays the regular in-state tuition; the sending state pays the receiving institution $2,000 per year in addition. The advantages run both ways —better educational opportunities for youth from "have-not" states and better financial support for existing medical schools.

In addition, WICHE is currently conducting a study of medical education needs and resources in the West. This comprehensive, region-wide study is under the immediate direction of Dr.

Dayton McKean of the University of Colorado Graduate School and will be reviewed by a representative advisory group before publication in 1958.

WICHE is active in related health science areas, notably nursing education and mental health training and research. In both areas, the commission has set up advisory councils, with representation from all over the West, to plan for a balanced growth—through complementary specialization of function—of Western professional and graduate education.

The New England Medical-Dental Education Program

Last February the New England Board of Higher Education proposed the New England Regional Medical-Dental Education Plan and recommended its adoption to the people of New England through their state legislatures. This plan is designed to assist and encourage the region's medical and dental schools in increasing the number of places for qualified New England students.

This action was taken because, in proportion to its population, fewer people from this region are entering these programs than from the nation as a whole. New England is not producing enough doctors and dentists from among its own residents to meet its own needs.

THE REGIONAL PLAN: Each New England medical school receives from funds appropriated to the Board from each of the participating states $2,500 per year for each student it enrolls from each state in excess of the number it enrolled from that state in 1956. This amount represents somewhat less than the average difference between what the student pays each year and the actual cost of instruction. Similarly, each dental school receives $1,500 and each state appropriates $1,500 for each student enrolled in excess of the number enrolled in 1956.

The plan has thus far been adopted by Maine, New Hampshire, Vermont, and Massachusetts. Supporting funds in amounts suggested by the Board were appropriated in these states except for New Hampshire, where a smaller amount was provided. The appropriations were: Massachusetts, $100,000; Maine, $20,000; New Hampshire, $8,000; and Vermont, $7,500. The sum recommended for Vermont was lower than for the others since under the plan that state, which supports its own medical school with tax funds, does not reimburse the University of Vermont for additional Vermont students.

The Board adopted a definition of residence based on those used by several publicly supported medical schools. During the past year an individual residence certificate was filed with the Board for every student enrolled in each of the region's medical and dental schools as of October, 1956, and for all students for whom New England residence was claimed as of October, 1957. The schools also have submitted certified class lists and statements of enrollment.

PROBLEMS OF RESIDENCE: When the given definition of residence was applied, the total number of New Englanders enrolled in 1956 was less than that reported earlier by the medical schools in an informal survey. Although many married students claim residence in the state in which they attend medical school, they do not merit this classification. Tabulation of the individual residence cards revealed that the number of residents enrolled in 1956 was 953, rather than 972, as was reported in the earlier survey.

IMPACT OF THE PLAN: The NEBHE plan was recommended by the Board last February and was not adopted by the state legislatures until several months later. Since by that time the incoming freshman classes had already been selected, the initial impact of the plan has not yet been felt. It will be a few years before its full effect can be ascertained.

COMPARATIVE ENROLLMENTS, *1956-1957:* The number of New England students in the region's medical schools in 1957 was 923 as compared with 953 for 1956, a 3.2% decrease.

The number enrolled in the dental schools increased from 333 to 345, a 3.7% increase.

In the medical schools there were increases for New Hampshire (8) and Rhode Island (1) and decreases for Connecticut (4), Maine (14), Massachusetts (20), and Vermont (1).

In dental schools there was a decrease for Connecticut (3) and increases for Maine (1), Massachusetts (2), New Hampshire (3), Rhode Island (4), and Vermont (5).

Four schools showed an increase of New England students: Dartmouth Medical School, 1; Harvard University School of Dental Medicine, 5; University of Vermont College of Medicine, 6; and Tufts University School of Dental Medicine, 7. Four enrolled fewer than last year: Boston University School of Medicine, 4; Harvard Medical School, 6; Tufts University School of Medicine, 21; and Yale University School of Medicine, 6.

FINANCIAL CONSIDERATIONS: Under the plan, payments are now due certain schools for enrolling a larger number of students from the four states which have adopted the plan, and the Board is now collecting and disbursing the funds.

The payments due from states which have joined the plan are: Maine, $5,500; Massachusetts, $41,500; New Hampshire, $29,500; Vermont, $10,000; and total, $86,500. However, since New Hampshire appropriated only $8,000, this amount will be prorated, and the schools will receive only 27% of the total due from that state.

SERIOUS CONDITIONS: Two serious conditions are already apparent. Since the number of bona fide residents in New England medical schools is smaller than was assumed, the enrollment of New Englanders in all schools in the country is probably less favorable than was previously supposed. Second, in most of the region's medical and dental schools New England residents are in competition for places with the best students from all over the country. Gaining admission at a time when facilities are limited will become increasingly less favorable for many qualified New England students than for those who live in states where sizable public institutions give first preference to their own residents and other regional students. A total decrease of 3.2% in one year is serious, and, in the case of Maine, the decrease of 14 students or 22.6% would seem to indicate a very critical situation.

If such conditions persist, it may be necessary for some New England states to consider additional plans so that qualified students will have opportunities equal to those in other sections of the country and so that future health needs of their residents will be met.

THE NATIONAL SOCIETY FOR MEDICAL RESEARCH

For a number of years the National Society for Medical Research has played a very important role in improving public understanding of the principles, methods, and needs of the biological and medical sciences. Its activities have become widely recognized, and its contributions to medical education, research, and medical care are of constantly increasing significance.

The following résumé describing the functions of the National Society for Medical Research has been prepared by its staff for this issue of the education number of The Journal.

The National Society for Medical Research founded in 1946 by America's medical colleges to deal with a symptom of public ignorance and misunderstanding of medical and biological science—the antivivisection movement—now functions to treat the disease itself. At first the society was wholly occupied with the stop-gap protection of animal research against immediate threats of legal prohibition and general harassment of medical laboratories by the antivivisection movement. This effort was quickly successful, and soon the society was able to turn a large portion of its capacity to long-range public education—though crises continue to arise from time to time.

There are many symptoms of public misunderstanding of medical science—superstition, quackery, resistance to inoculation, militant antidissection and antiexperimentalist movements, ignorance, and apathy toward the needs and problems of scientific research.

In attacking the disease, the NSMR administers preventive medicine in two principal ways. First, the society starts chain-reaction educational projects. For example, through the American College Public Relations Association the old blockade against full reporting of the role of animals in research was, for the most part, swept away. Use of animals in research ceased to be a dark and sinister secret.

Second, the NSMR initiated positive action programs to help medical science. The society formulated a model statute for the utilization of unwanted dogs and cats ordinarily killed in public dog pounds. Today three out of four medical schools in the United States receive their needed dogs and cats from this source.

The society instigated the $4,000,000 worth of libel suits against the Hearst press that helped end the Hearst campaign against experimental medicine.

The society gave assistance in forming the Animal Care Panel, an organization devoted entirely to the exchange of technical information on the care of laboratory animals.

Last year a committee of the NSMR began formulating plans for a national conference on the legal environment of medical science. Because of the hodge-podge of laws affecting medical science in the various states, the conference, scheduled for the spring of 1959, will aim toward producing a Uniform Legal Code for the Medical Sciences. Included in the model code will be laws governing property rights in dead human bodies and provisions for bequests of whole bodies or parts for bioanatomical studies and for the transplants of organs. Laws governing animal experimentation and disposition of unclaimed animals will also be part of the model code.

The conference will be the basis for extensive publicity on the practical problems and needs of medical science.

The National Society for Medical Research is supported by the medical schools, by virtually all of the professional organizations in medicine and biology, and by commercial organizations concerned with medical research. The society's work is public education. Its purpose is to expedite medical progress.

MEDICAL SCHOOLS

APPROVED AND NEWLY DEVELOPING MEDICAL SCHOOLS

Table 12 lists by states the approved four year medical schools and schools of basic medical sciences, indicating for each school, public or private ownership, year of organization, tuition charges, enrollment by class and other basic data. Similar data is presented in the same table for the newly developing schools and in table 13 for Canadian schools.

In the 1957-1958 academic year, there was no change in the number of approved four year medical schools in the United States (78) or Canada (12). There remain four approved schools of basic medical sciences in the United States while all of

TABLE 12.—*Approved Medical Schools and Schools of the Basic Sciences in the United States*

State	No.		Ownership	Year Organized	Tuition		Premedical Requirement by Year	Students by Classes, 1957-1958 (Full-Time, Part-time, & Special Students Included)					Part-Time & Special Students†	Graduates 7/1/57 to 6/30/58		
					Resident	Non-resident		1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	Total				
Ala.	1	Medical College of Alabama, Birmingham	Pub.	1859	$ 445.00	$ 845.00	100 S.H.*	81	71	68	69	289	3	68	Robert C. Berson, M.D., Dean	1
Ark.	2	University of Arkansas School of Medicine, Little Rock	Pub.	1879	380.00	None	3	93	93	74	85	345	2	85	F. Douglas Lawrason, M.D., Dean	2
Calif.	3	College of Medical Evangelists, Loma Linda, Los Angeles	Pri.	1909	1,250.00	1,250.00	3	112	94	82	96	384	15	96	Walter E. Macpherson, M.D., Dean	3
	4	University of California School of Medicine, Los Angeles	Pub.	1951	350.00	600.00	4	49	50	48	48	195	0	47	Stafford Warren, M.D., Dean	4
	5	University of Southern California School of Medicine, Los Angeles	Pri.	1885	1,120.00	1,120.00	3	67	67	69	61	264	0	60	Clayton G. Loosli, M.D., Dean	5
	6	Stanford University School of Medicine, San Francisco	Pri.	1908	1,005.00	1,005.00	3	62	61	57	54	234	1	54	Robert H. Alway, M.D., Dean	6
	7	University of California School of Medicine, San Francisco	Pub.	1864	350.00	600.00	3	79	81	81	83	324	0	83	John B. deC. Saunders, M.D., Dean	7
Colo.	8	University of Colorado School of Medicine, Denver	Pub.	1883	655.00	1,055.00	3	85	70	86	77	318	0	79	Robert J. Glaser, M.D., Dean	8
Conn.	9	Yale University School of Medicine, New Haven	Pri.	1812	1,025.00	1,025.00	3	79	80	78	72	309	3	72	Vernon Lippard, M.D., Dean	9
D.C.	10	Georgetown University School of Medicine, Washington	Pri.	1851	1,060.00	1,060.00	3-4	108	106	93	100	407	0	100	Hugh H. Hussey, M.D., Dean	10
	11	George Washington University School of Medicine, Washington	Pri.	1825	1,000.00	1,000.00	3	101	101	91	90	383	1	90	John L. Parks, M.D., Dean	11
	12	Howard University College of Medicine, Washington	Pri.	1868	591.75	591.75	3	103	73	77	67	320	3	67	Robert S. Jason, M.D., Dean	12
Fla.	13	University of Miami School of Medicine, Coral Gables	Pri.	1952	800.00	1,500.00	3	79	64	62	60	265	0	60	Homer F. Marsh, Ph.D., Dean	13
Ga.	14	Emory University School of Medicine, Emory University	Pri.	1854	1,000.00	1,000.00	3	74	71	67	66	278	3	66	Arthur P. Richardson, M.D., Dean	14
	15	Medical College of Georgia, Augusta	Pub.	1828	455.00	None	3	103	95	93	95	386	6	93	Harry B. O'Rear, M.D., Dean	15
Ill.	16	Chicago Medical School	Pri.	1912	672.00	672.00	4	73	71	64	67	275	0	65	John J. Sheinin, M.D., President	16
	17	Northwestern University Medical School, Chicago	Pri.	1859	945.00	945.00	3	130	123	135	131	519	0	131	Richard H. Young, M.D., Dean	17
	18	Stritch School of Medicine of Loyola University, Chicago	Pri.	1915	800.00	800.00	3	88	86	88	75	337	0	73	John F. Sheehan, M.D., Dean	18
	19	University of Chicago, The School of Medicine	Pri.	1927	1,060.00	1,060.00	3	72	73	74	69	288	0	70	Lowell T. Coggeshall, M.D., Dean Division of Biological Sciences	19
	20	University of Illinois College of Medicine, Chicago	Pub.	1881	343.50	763.50	3	190	179	158	150	677	0	150	Granville A. Bennett, M.D., Dean	20
Ind.	21	Indiana University School of Medicine, Bloomington; Indianapolis	Pub	1903	430.00	750.00	3	158	146	139	140	583	0	138	John D. Van Nuys, M.D., Dean	21
Iowa	22	State University of Iowa College of Medicine, Iowa City	Pub.	1850	400.00	800.00	3	120	110	99	105	434	2	104	Norman B. Nelson, M.D., Dean	22
Kans.	23	University of Kansas School of Medicine, Lawrence, Kansas City	Pub.	1905	475.00	925.00	4	102	96	107	107	412	2	107	W. Clarke Wescoe, M.D., Dean	23
Ky.	24	University of Louisville School of Medicine	Pri.	1837	900.00	1,300.00	3	103	97	87	95	382	5	95	J Murray Kinsman, M.D., Dean	24
La.	25	Louisiana State University School of Medicine, New Orleans	Pub.	1931	120.00	520.00	3	125	103	111	95	434	4	95	William W. Frye, M.D., Dean	25
	26	Tulane University of Louisiana School of Medicine, New Orleans	Pri.	1834	1,100.00	1,100.00	3	134	121	120	128	503	2	128	Maxwell E. Lapham, M.D., Dean	26
Md.	27	Johns Hopkins University School of Medicine, Baltimore	Pri.	1893	1,280.00	1,280.00	Degree	74	71	73	75	293	0	75	Thomas B. Turner, M.D., Dean	27
	28	University of Maryland School of Medicine & College of Physicians and Surgeons, Baltimore	Pub.	1807	765.00	915.00	3	93	99	85	78	355	0	78	William S. Stone, M.D., Dean	28
Mass.	29	Boston University School of Medicine	Pri.	1873	1,000.00	1,000.00	3	74	78	67	72	291	0	71	Chester S. Keefer, M.D., Dean	29
	30	Harvard Medical School, Boston	Pri.	1783	1,068.00	1,068.00	2	114	115	148	135	512	0	135	George Packer Berry, M.D., Dean	30
	31	Tufts University School of Medicine, Boston	Pri.	1893	1,015.00	1,015.00	3	114	102	105	109	430	1	109	Joseph M. Hayman Jr., M.D., Dean	31
Mich.	32	University of Michigan Medical School, Ann Arbor	Pub.	1850	550.00	980.00	3	206	183	190	171	750	8	169	A. C. Furstenberg, M.D., Dean	32
	33	Wayne State University College of Medicine, Detroit	Pub.	1885	552.00	981.00	3	75	68	67	72	282	1	72	Gordon H. Scott, Ph.D., Dean	33
Minn.	34	University of Minnesota Medical School, Minneapolis	Pub.	1883	460.00	900.00	3	131	124	120	114	489	6	113	Robert B. Howard, M.D., Dean	34
Miss.	35	University of Mississippi School of Medicine, Jackson	Pub.	1903	600.00	825.00	3	80	66	63	44	253	0	44	David S. Pankratz, M.D., Dean	35
Mo.	36	University of Missouri School of Medicine, Columbia	Pub.	1810	Fees—No Tuition 355.00-498.00	None	3	75	65	31	35	206	5	32	Roscoe L. Pullen, M.D., Dean	36
	37	Saint Louis University School of Medicine	Pri.	1903	1,000.00	1,000.00	3	121	110	119	117	467	8	117	James W. Colbert Jr., M.D., Dean	37
	38	Washington University School of Medicine, St. Louis	Pri.	1899	924.00	924.00	3	86	82	88	88	344	0	87	Oliver H. Lowry, M.D., Dean	38
Neb.	39	Creighton University School of Medicine, Omaha	Pri.	1892	912.00	912.00	3	77	67	74	65	283	0	64	F. G. Gillick, M.D., Dean	39
	40	University of Nebraska College of Medicine, Omaha	Pub.	1881	525.00	765.00	3	87	82	75	83	327	2	83	James P. Tollman, M.D., Dean	40
N.Y.	41	Albany Medical College of Union University	Pri.	1839	1,012.00	1,012.00	3	63	55	51	60	229	0	60	Harold C. Wiggers, Ph.D., Dean	41
	42	University of Buffalo School of Medicine	Pri.	1846	1,080.00	1,080.00	3	84	72	70	78	304	6	78	Ernest Witebsky, M.D., Acting Dean	42
	43	Columbia University College of Physicians and Surgeons, New York City	Pri.	1767	1,183.00	1,183.00	3	120	117	118	115	470	0	115	Howard C. Taylor Jr., M.D., Dean	43
	44	Cornell University Medical College, New York City	Pri.	1898	1,250.00	1,250.00	3	84	86	82	82	334	0	81	John E. Deitrick, M.D., Dean	44
	45	New York Medical College, Flower & Fifth Avenue Hospitals, New York City	Pri.	1860	1,036.00	1,036.00	4	128	130	124	115	497	0	115	Ralph E. Snyder, M.D., Dean	45
	46	New York University College of Medicine, New York City	Pri.	1841	1,117.00	1,117.00	3	134	131	129	125	519	1	125	Donal Sheehan, M.D., Dean	46
	47	State University of New York, Downstate Medical Center, New York City	Pub.	1860	715.00	715.00	3	153	148	142	146	589	1	145	Robert A. Moore, M.D., Dean	47
	48	University of Rochester School of Medicine and Dentistry	Pri.	1920	1,000.00	1,000.00	3	71	69	69	74	283	1	73	Donald G. Anderson, M.D., Dean	48
	49	State University of New York, Upstate Medical Center, Syracuse	Pub.	1834	715.00	715.00	3	86	75	68	71	300	7	71	Carlyle Jacobsen, Ph.D., Dean	49
N.C.	50	University of North Carolina School of Medicine, Chapel Hill	Pub.	1879	671.00	1,271.00	3	69	69	61	58	257	1	58	W. Reece Berryhill, M.D., Dean	50
	51	Duke University School of Medicine, Durham	Pri.	1930	1,020.00	1,020.00	3	79	76	79	81	315	5	81	Wilburt C. Davison, M.D., Dean	51
	52	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	Pri.	1902	825.00	825.00	3	54	51	50	49	204	1	49	Coy C. Carpenter, M.D., Dean	52
Ohio	53	University of Cincinnati College of Medicine	Pub.	1819	700.00	900.00	3	93	91	82	77	343	0	76	Stanley E. Dorst, M.D., Dean	53
	54	Western Reserve University School of Medicine, Cleveland	Pri.	1843	1,000.00	1,000.00	3	82	86	80	77	325	5	77	Joseph T. Wearn, M.D., Dean	54
	55	Ohio State University College of Medicine, Columbus	Pub.	1914	630.00	None	4	150	142	142	138	572	25	139	Charles A. Doan, M.D., Dean	55
Okla.	56	University of Oklahoma School of Medicine, Oklahoma City	Pub.	1900	500.00	1,000.00	3	100	95	94	83	372	0	84	Mark R. Everett, Ph.D., Dean	56

Ore.	57	University of Oregon Medical School, Portland	Pub.	1887	570.00	813.00	3	79	65	77	71	292	19	70	D. W. E. Baird, M.D., Dean	57
Pa.	58	Hahnemann Medical College and Hospital of Philadelphia	Pri.	1848	922.00	922.00	3	108	96	94	96	394	0	96	Charles Cameron, M.D., Dean	58
	59	Jefferson Medical College of Philadelphia	Pri.	1825	882.52	882.52	3	178	167	177	160	682	0	158	William A. Sodeman, M.D., Dean	59
	60	Temple University School of Medicine, Philadelphia	Pri.	1901	900.00	900.00	3	136	121	120	118	495	2	118	William N. Parkinson, M.D., Dean	60
	61	University of Pennsylvania School of Medicine, Philadelphia	Pri.	1765	1,000.00	1,000.00	3	128	125	130	126	509	1	126	John McK. Mitchell, M.D., Dean	61
	62	Woman's Medical College of Pennsylvania, Philadelphia	Pri.	1850	1,075.00	1,075.00	3	51	47	41	46	185	0	45	Marion Fay, Ph.D., Dean	62
	63	University of Pittsburgh School of Medicine	Pri.	1883	1,018.00	1,018.00	3	102	97	85	81	365	0	80	Francis S. Cheever, M.D., Dean	63
Puerto Rico	64	University of Puerto Rico School of Medicine, San Juan	Pub.	1949	558.00	558.00	3	53	44	46	45	188	1	45	E. Harold Hinman, M.D., Dean	64
S.C.	65	Medical College of South Carolina, Charleston	Pub.	1823	592.50	No Freshmen	3	80	75	75	75	305	0	75	John T. Cuttino, M.D., Dean	65
Tenn.	66	University of Tennessee College of Medicine, Memphis	Pub.	1851	567.00	912.00	3	220	196	172	180	768	3	182	Maston Kennerly Callison, M.D., Dean	66
	67	Meharry Medical College, Nashville	Pri.	1876	794.00	794.00	3	73	66	69	59	267	3	57	Daniel T. Rolfe, M.D., Dean	67
	68	Vanderbilt University School of Medicine, Nashville	Pri.	1873	1,010.00	1,010.00	Bachelor's or Senior In Absentia	53	50	48	46	197	2	46	John W. Patterson, M.D., Dean	68
Tex.	69	University of Texas Southwestern Medical School, Dallas	Pub.	1943	300.00	None	3	104	96	96	92	388	7	90	Atticus J. Gill, M.D., Dean	69
	70	University of Texas Medical Branch, Galveston	Pub.	1887	350.00	None	90 S.H.*	132	154	136	151	573	0	151	John B. Truslow, M.D., Dean	70
	71	Baylor University College of Medicine, Houston	Pri.	1900	897.50	897.50	3	86	82	75	78	321	17	78	Stanley W. Olson, M.D., Dean	71
Utah	72	University of Utah School of Medicine, Salt Lake City	Pub.	1905	480.00	830.00	3	58	52	49	48	207	1	48	Philip B. Price, M.D., Dean	72
Vt.	73	University of Vermont College of Medicine, Burlington	Pub.	1822	595.00	1,045.00	Degree	51	49	41	38	179	5	38	George A. Wolf, M.D., Dean	73
Va.	74	University of Virginia School of Medicine, Charlottesville	Pub.	1825	514.00	964.00	3	77	72	75	66	290	0	66	Thomas Harrison Hunter, M.D., Dean	74
	75	Medical College of Virginia, Richmond	Pub.	1838	671.00	1,021.00	3	85	79	97	96	357	0	97	William F. Maloney, M.D., Dean	75
Wash.	76	University of Washington School of Medicine, Seattle	Pub.	1945	438.00	768.00	3	75	69	72	72	288	1	72	George N. Aagaard, M.D., Dean	76
Wis.	77	University of Wisconsin Medical School, Madison	Pub.	1907	380.00	730.00	3	90	82	72	76	320	16	76	John Z. Bowers, M.D. Dean	77
	78	Marquette University School of Medicine, Milwaukee	Pri	1913	950.00	950.00	4	105	93	99	96	393	6	96	John S Hirschboeck, M.D., Dean	78
		Totals						7,651	7,164	7,000	6,888	28,703	220	6,861		
		Approved Schools of Basic Medical Sciences														
N.H.	1	Dartmouth Medical School, Hanover	Pri	1797	1,170.00	1,170.00	Bachelor's or 3 Yrs. Candidacy For Bachelor's	24	24	...	...	48	0	0	Rolf C. Syvertsen, M.D., Dean	1
N.D.	2	University of North Dakota School of Medicine, Grand Forks	Pub.	1905	178.00	416.00	3	40	38	...	...	78	2	0	Theodore H. Harwood, M.D., Dean	2
S.D.	3	State University of South Dakota School of Medicine, Vermillion	Pub.	1907	320.00	600.00	3	46	34	...	...	80	4	0	W. L. Hard, Ph.D., Dean	3
W.Va.	4	West Virginia University School of Medicine, Morgantown	Pub.	1902	266.00	702.00	3	40	30	...	...	70	0	0	Edward J. Van Liere, M.D., Dean	4
		Totals						150	126	...	...	276	6	0		
		Totals						7,801	7,290	7,000	6,888	28,979	226	6,861		
		Schools Developing New Programs‡														
Fla.	1	University of Florida College of Medicine, Gainesville	Pub.	1956	600.00	1,200.00	4	51	41	...	...	92	0	0	George T. Harrell, M.D., Dean	1
N.J.	2	Seton Hall College of Medicine and Dentistry, Jersey City	Pri.	1956	950.00	950.00	3	80	77	...	...	157	0	0	Charles L. Brown, M.D., Dean	2
N.Y.	3	Albert Einstein College of Medicine of Yeshiva University, New York City	Pri.	1955	1,050.00	1,050.00	4	98	96	57	...	245	0	0	Marcus D. Kogel, M.D., Dean	3
		Totals						229	214	51	...	491	0	0		
		Grand Totals						8,030	7,504	7,051	6,888	29,473	226	6,861		

---

* S.H.—Semester hours

† Part time and special students included in enrollment figures.

‡ Provisionally approved on the basis of full implementation of the first two years' program.

Tuition

University of California, L.A.
University of California, S.F.
University of Colorado
College of Medical Evangelists
University of Oregon
University of Utah
University of Washington

Residents of Arizona, Idaho, Montana, New Mexico, Wyoming, and Alaska who enroll under the Western Interstate Commission for Higher Education's student exchange program will pay the standard resident tuition.

Medical College of Georgia: Tuition includes breakage deposit, health, and activities fees.
Nonresident students of other approved medical schools are considered for advanced standing.
The nonresident tuition and fees are $755.

University of Michigan: Tuition subject to change.

Medical College of South Carolina: Non resident students of other approved medical schools are considered for advanced standing.
Nonresident tuition and fees are $1,592.50.

Premedical Requirement by Year

Cornell University: Three years, if degree will be granted in absentia.
Dartmouth Medical School: Bachelor's degree or three years and candidacy for the bachelor's degree.
University of Louisville: Degree preferred. Otherwise senior in absentia.
Vanderbilt University: Bachelor's degree or senior in absentia.
Vermont University: Four years and a Bachelor's degree.
Western Reserve University: Three years minimum.
Four years preferred.
Woman's Medical College: Four years preferred.
Baylor University: Four years with degree strongly preferred.
Bowman Gray School of Medicine: Degree strongly recommended.
Ohio State University: Four years or Arts & Medicine.

the Canadian schools present a full four-year program. It is anticipated that one of the schools of basic medical sciences, West Virginia University School of Medicine, will enroll students in the third-year class in its now developing clinical facilities by 1960. It will be eligible for approval as a four-year institution during 1961-1962.

Of the newly developing medical schools, the initial class at Albert Einstein College of Medicine has completed three years of study, while initial classes at the University of Florida College of Medicine and Seton Hall College of Medicine and Dentistry have completed their first two years of medical study. Provisional approval was granted Albert Einstein in the academic year 1956-1957; the University of Florida and Seton Hall were granted similar approval during this past year.

The University of Kentucky School of Medicine is the only other medical school presently undergoing active development. It is expected that the first class will enter this institution in the fall of 1960.

There has been an initial or continuing interest expressed in the potentiality of constructing new medical schools in Connecticut (Hartford as part of the University of Connecticut); Texas (San Antonio or Austin as part of the University of Texas); Arizona, Idaho, and Massachusetts (Boston as part of Massachusetts Institute of Technology). In the latter three instances initial interest appears to be directed toward the possibility of developing two year schools of basic medical sciences. Early but perhaps less well-formulated interest in the development of new medical schools is present in New York, Philadelphia, and Illinois.

CONSTRUCTION OF FACILITIES

During the year 1957-1958 there was an unusual amount of construction activity as 60 United States and 5 Canadian schools reported the initiation of new construction, the completion of construction, or the commitment of funds for construction to be initiated during 1958-1959. Thirty United States schools indicated the initiation of 41 construction projects, 26 United States schools completed construction of 29 projects, and 28 United States schools have funds committed for 35 projects with construction to begin in 1958-1959. One project was initiated by a Canadian school, five were completed at four schools, and in two institutions funds are committed for projects with construction to begin in 1958-1959. Table 14 presents estimates of construction and equipment costs for these projects.

Major construction completed during the past year in the United States includes seven new facilities or expansion and/or renovation of old facilities primarily for research, eight primarily for teaching, four clinical facilities, and three student dormitories. Howard and Indiana completed new basic science buildings and SUNY Syracuse completed a substantial addition to its old building which was also renovated.

Major construction initiated includes 15 new facilities or expansion and/or renovation of old facilities primarily for research, seven primarily for teaching, seven clinical facilities, and five student dormitories. Stanford initiated construction of its new basic science building and hospital in Palo Alto in anticipation of moving the medical school from San Francisco to the University campus. Johns Hopkins began construction of a new basic science building. The new hospital at West Virginia was begun anticipating expansion of the school to include the full four-year program.

Major construction planned for initiation in 1958-1959 with funds already committed includes 19 new facilities or expansion and/or renovation of old facilities primarily for research, eight primarily for teaching, seven clinical facilities, and two student dormitories. Tulane will begin construction

TABLE 13.—*Approved Medical*

Province	Approved Medical Schools	Year Organized	Tuition		Premedical Requirement*
			Resident	Nonresident	
Alta.	1 University of Alberta Faculty of Medicine, Edmonton	1913	$391.25(1) 501.25(2) 551-25(3-4)	Same	3
B.C.	2 University of British Columbia, School of Medicine, Vancouver	1949	445.00	Same	3
Man.	3 University of Manitoba Faculty of Medicine, Winnipeg	1883	531.00	Same	3
N.S.	4 Dalhousie University Faculty of Medicine, Halifax	1867	531.00	731	3
Ont.	5 Queen's University Faculty of Medicine, Kingston	1854	395.00-A† 545.00-B	Same	1‡
	6 University of Western Ontario Faculty of Medicine, London	1881	585.00	Same	3
	7 University of Ottawa Faculty of Medicine, Ottawa	1945	534.00	834	1‡
	8 University of Toronto Faculty of Medicine, Toronto	1843	591.50(1-2-3) 601.50(4)	Same	1‡§
Que.	9 McGill University Faculty of Medicine, Montreal	1828	750.00	Same	3‖
	10 University of Montreal Faculty of Medicine, Montreal	1843	545.00	630	Degree
	11 Laval University Faculty of Medicine, Quebec	1852	520.00	Same	Degree
Sask.	12 University of Saskatchewan College of Medicine, Saskatoon	1926	472.00(1) 522.00(2-3-4)	Same	3
	Totals				

* Number of premedical years required after Junior matriculation in high school for admission to medical school.

† A, premedicine; B, medicine.

‡ In the case of Queen's Ottawa, and Toronto, where years of premedical college work is under the Faculty of Medicine in addition to the four years of medical school itself, the figure given admits to the first premedical college year of the faculty. To enter the four-year medical school program directly, two years of college are needed in addition to the figure given.

§ Degree in arts and sciences if college work is taken elsewhere.

‖ A very definite preference is given to those who have baccalaureate degrees.

¶ Intern and premedical figures not included.

of a large teaching and research building that will bring all departments together on one campus. Wayne plans to begin building a new basic science facility. New York University will get construction under way for its new hospital and Utah will undertake the construction of a new medical center building.

In Canada, Alberta completed a substantial expansion of its basic science building; British Columbia completed a pathology building and will begin construction of a new basic science building in the forthcoming year; and McGill will initiate construction of the first unit of its new medical center.

MEDICAL SCHOOL EXPENDITURES

In last year's report on Medical Education in the United States and Canada, specific quantitative data on medical school expenditures were not presented because of lack of assurance in regard to the completeness and validity of the information solicited in the annual questionnaire that serves as the basis for much of the material in these reports. There continues to be a need for a clearer concept of medical school costs. Because of his experience and continuing interest, Mr. A. J. Carroll,* Business Officer, State University of New York Upstate Medical Center, was asked to design the question dealing with medical school expenditures in this year's questionnaire. Mr. Carroll framed a question which solicited from each school actual expenditures for 1956-1957 and estimated expenditures for 1957-1958 under each of the items listed in table 15.

Schools in Canada

1st Premedical Year	2nd Premedical Year	1st Year	2nd Year	3rd Year	4th Year	Required Intern Year	Total	Part Time and Irregular Student	Graduates 5-1-57 to 6-30-58		
0	0	58	52	59	45	0	214	0	47	John W. Scott, M. D., Dean....................	1
0	0	61	57	49	47	0	214	0	47	H. Rocke Robertson, M. D., Acting Dean....	2
0	0	70	51	60	45	0	226	0	45	Lennox G. Bell, M. D., Dean..................	3
0	0	61	59	51	52	56	223¶	0	56	C. B. Stewart, M. D., Dean....................	4
57	53	61	58	58	46	0	223¶	0	45	G. Shrold Ettinger, M. D., Dean..............	5
0	0	63	55	54	57	0	229	0	57	J. B. Collip, M. D., Dean......................	6
16	35	72	64	59	42	0	237¶	0	36	Jean-Jacques Lussier, M. D., Dean............	7
131	121	160	149	147	123	0	579¶	0	119	J. A. MacFarlane, M. D., Dean................	8
0	0	116	101	107	110	0	434	0	108	Lloyd G. Stevenson, M. D., Dean............	9
0	0	121	110	107	103	0	441	0	113	Wilbrod Bonin, M. D., Dean..................	10
0	0	135	131	141	122	121	529¶	0	119	Jean-Baptiste Jobin, M. D., Dean............	11
0	0	34	29	36	38	0	137	2	36	J. Wendell Macleod, M. D., Dean.............	12
204	209	1,012	916	928	830	177	3,686¶	2	828		

The data in table 15 are presented with more assurance in regard to completeness but nonetheless with considerable reserve as to the accuracy with which they present total medical school costs or estimates of costs. Because these figures have a different base than financial data presented in previous reports, they cannot and should not be compared with what superficially may appear to be similar cost figures in reports of other years.

The greatest doubt as to the accuracy in reflecting the grand totals of actual and estimated expenditures is the lack of uniform practices and terminology. For example, there is no generally accepted method within medical schools of accounting for direct costs of patient care in teaching hospitals. Undoubtedly in certain instances some such costs are included, and in others they are not a part of the individual school sums that are reflected in these totals.

In table 15 with each item there is an indication of the number of schools which reported sums under that item and the composite of which represents the total for that item. It is to be emphasized that the number of schools reporting under a given item reflects a mixture of both schools expending funds from that source and also accounting procedures that result in the expenditure of those funds being identified under that heading. One of many possible examples is cited for clarification. All schools receive funds from students as payment of charges for tuition and fees (*j*), yet 30 schools report no expenditure of funds under this item. Of the private schools not reporting, the expenditure would most always be included under the item for general university funds (*h*). Of the state schools not reporting, the expenditure could be and in some instances is included under general university funds (*h*), state appropriation (*f*) or state subsidy (*g*).

Under these circumstances, the data cannot be broken down validly to indicate the percentage of total expended funds that originated in any listed source. The sums presented under actual expenditures for 1956-1957 and estimated expenditures for 1957-1958, however, are based on sufficiently similar accounting practices within each school to make certain comparisons feasible.

TABLE 14.—*Estimates of Costs for Construction of Facilities*

United States Schools, 1957-1958	Estimated Construction Cost	Estimated Equipment Cost	Total
Construction Initiated	$63,660,000	$10,310,000	$ 73,970,000
Construction Completed	37,450,000	4,520,000	41,970,000
Construction Planned*	90,355,000	11,000,000	101,355,000
Canadian Schools, 1957-1958			
Construction Initiated	1,000,000	340,000	1,340,000
Construction Completed	5,530,000	270,000	5,800,000
Construction Planned†	4,300,000	250,000	4,550,000

* Funds already committed and construction planned for 1958-1959.
† Some schools reported equipment costs as part of construction costs.

Expenditures estimated for 1957-1958 were 13% greater (32 million dollars) than actual expenditures for 1956-1957. Increments greater than the estimated 13% in total expenditures are found in items for endowment income (*i*) 20%, grants and gifts for teaching (*c* and *d*) 19%, state appropriation (*f*) 19%, teaching expenses paid from medical service funds (*m*) 18%, overhead on grants (*k*) 17%, and grants and gifts for research (*a* and *b*) 16%. Estimates of expenditures from all other items (*e*, *g*, *h*, *j*, *l*, *n*, and *o*) are of a lesser increase than that estimated for the total.

Table 15.—*Medical School Expenditures**

Sources of Funds	Number of Schools Reporting Item	Actual Expenditures, 1956-1957	Number of Schools Reporting Item	Estimated Expenditures, 1957-1958
(a) Federal grants for research	85	$ 45,646,376.75	85	$ 56,021,273.85
(b) Nongovernment gifts and grants for research	83	29,040,287.73	82	31,437,093.33
Subtotal, items a & b		$ 74,686,664.48		$ 87,458,367.18
(c) Federal grants for teaching	81	11,043,755.04	81	13,845,499.79
(d) Nongovernment gifts and grants for teaching	61	7,463,321.60	61	8,158,896.97
Subtotal, items c & d		$ 18,507,076.64		$ 22,004,396.76
(e) Unrestricted gifts & grants	58	6,508,702.56	58	6,976,573.66
(f) State, county, or city appropriation for defrayal of medical school expenses	41	40,983,688.74	41	47,734,431.87
(g) State, county, or city subsidies paid as reimbursement for medical school expenses	10	2,350,308.02	11	2,481,812.79
(h) General University Funds	49	34,704,843.29	48	36,730,751.75
(i) Endowment income	51	13,826,905.34	52	16,616,219.60
(j) Tuition and fees	55	16,055,102.66	57	17,514,008.39
(k) Overhead on grants	43	3,948,226.34	43	4,633,153.41
(l) Teaching expenses (Faculty and supporting staff salaries and related supplies) paid by hospitals and clinics	30	13,252,104.02	29	13,879,980.57
(m) Teaching expenses paid from medical service funds	21	3,831,831.68	21	4,653,361.55
(n) Costs of services and expenses provided by university (administrative, building & grounds, student health)	29	8,303,688.44	29	8,825,022.00
(o) Other	24	2,649,912.01	24	2,867,323.00
Grand Total (Items a through o)	85	$239,609,054.22	85	$272,375,402.53

* Please refer to text under this same title.

The total actual expenditure for the median four-year school in full operation for 1956-1957 was between $2.370 million and $2.443 million. The total estimated expenditure for the median four-year school in full operation for 1957-1958 was between $2,871,000 and $2,877,000. The estimated total increase in expenditures for the median school amounted to almost $500,000. The range of change between funds expended by all 85 schools in 1956-1957 and their estimated expenditures was from $600,000 to more than $1,400,000. Eighty schools estimated increased expenditures, and only five estimated lesser expenditures.

In 1956-1957, 33 of 85 schools expended less than 2 million dollars. In 1957-1958, 28 of the 85 schools estimated expenditures under 2 million dollars.

It is pertinent to again point out that data presented for medical school expenditures cannot with present knowledge be translated into costs of educating medical students—or indeed any other single function of medical schools. These meaningful interpretations will be possible only when there is available a uniform, functional cost accounting system. The reader is referred to the section of this report on Medical School Financing for information in regard to a proposed study of medical school costs on this basis.

Canadian schools' expenditures are not presented since the returns from several schools did not contain adequate information.

FULL-TIME FACULTY POSITIONS IN THE UNITED STATES UNFILLED 1957-1958

Previous references elsewhere in this report have been made to the recognized needs for additional educational facilities in medicine to prepare increased numbers of physicians to provide health care to a rapidly expanding population. The creation of new and the expansion of existing medical schools pose difficult and serious problems in relation to site selection, construction of facilities, and financing. However, even if these problems were resolved and additional facilities were now available, they would be of limited value without adequate numbers of competent faculty.

The number of budgeted full-time faculty positions unfilled in 1957-1958 are presented in table 16. These data should excite real concern in all individuals interested in maintaining high standards in medicine for they reflect a sharp increase in what was before only a suggestive upward trend in the numbers of unfilled faculty posts (table 17). Unless this trend is broken, it seems unlikely that additional physical resources in medical education will be able to be staffed effectively.

A comprehensive study undertaken by the National Academy of Sciences promises to cast considerable light on this problem. Some of the early available information from that study appears in this report under title of "National Academy of Sciences–National Research Council Study: Postdoctoral Education in the Medical Sciences and Research; A Preliminary Report."

Table 16 indicates that 32% of all the unfilled positions are newly created posts. The number of unfilled newly created posts last year represented a larger segment (45%) of last year's total vacancies.

---

* See section of report titled Medical School Financing.

This shift indicates that this problem is not primarily related to a change in the basic nature of the educational program.

In view of the growing size of the problem of faculty recruitment, it is heartening to note that enrollments in advanced degree programs in the basic medical sciences (see section under this title) are increased over last year, since students in these programs represent the most assured pool of future faculty for the basic science disciplines. However, this at best can result in providing only a part of the additional faculty members needed.

Table 16.—*Budgeted Unfilled Full-Time Faculty Positions in Medical Schools of the United States, 1957-1958*

	Newly Budgeted Positions, No.					Old Positions, No.					Old and New Positions, Total				
	Instructor	Assistant Professor	Associate Professor	Professor	Total	Instructor	Assistant Professor	Associate Professor	Professor	Total	Instructor	Assistant Professor	Associate Professor	Professor	Total
Basic Science Departments															
Anatomy	5	12	1	1	19	14	1	4	7	26	19	13	5	8	45
Biochemistry	2	3	1	0	6	7	6	4	5	22	9	9	5	5	28
Microbiology	2	7	0	2	11	8	12	6	4	30	10	19	6	6	41
Pathology	3	6	2	0	11	7	20	12	8	47	10	26	14	8	58
Pharmacology	2	6	2	0	10	8	6	6	2	22	10	12	8	2	32
Physiology	5	7	1	1	14	6	5	5	5	21	11	12	6	6	35
Subtotals	19	41	7	4	71	50	50	37	31	168	69	91	44	35	239
Clinical Departments															
Anesthesiology	5	1	0	2	8	8	3	2	3	16	13	4	2	5	24
Dermatology	0	0	0	0	0	0	2	1	1	4	0	2	1	1	4
Medicine	6	4	5	3	18	10	14	6	7	37	16	18	11	10	55
Neurology	0	2	1	1	4	0	0	2	1	3	0	2	3	2	7
Obstetrics & gynecology	4	4	1	2	11	6	7	0	4	17	10	11	1	6	28
Ophthalmology	0	1	0	0	1	2	2	2	2	8	2	3	2	2	9
Orthopedic surgery	2	0	0	0	2	3	4	3	1	11	5	4	3	1	13
Otolaryngology	3	0	0	1	4	1	2	2	3	8	4	2	2	4	12
Pediatrics	4	3	0	3	10	8	6	9	2	25	12	9	9	5	35
Physical medicine	2	2	1	2	7	1	1	0	1	3	3	3	1	3	10
Psychiatry	3	12	3	9	27	14	7	3	4	28	17	19	6	13	55
Public health & preventive medicine	4	5	2	1	12	6	8	12	6	32	10	13	14	7	44
Radiology	5	1	0	1	7	8	4	6	5	23	13	5	6	6	30
Surgery	5	4	3	1	13	10	6	10	5	31	15	10	8	11	44
Urology	1	0	0	0	1	0	1	1	2	4	1	1	1	2	5
Other Clinical Departments	0	0	0	0	0	3	0	0	2	5	3	0	0	2	5
Subtotals	41	39	16	26	125	80	67	59	49	255	124	106	70	80	350
Totals	63	80	23	30	196	130	117	96	80	423	193	197	114	115	619

It is to be emphasized that the vacancies existing in faculty posts presented in table 16 reflect only the numbers of faculty personnel required to maintain medical education at today's qualitative level and to produce graduates of the present quantitative order. Higher educational standards will not be solely related to increasing numbers of full-time faculty. Almost surely augmented numbers of competent teaching personnel will be an important factor in attaining advanced educational levels. It is certain that expansion of educational opportunities in medicine to meet the physician needs of an enlarging population can occur without serious harm to the quality of medicine taught and therefore of medicine practiced, only with a concomitant expansion of the body of full-time faculty.

GRADUATE EDUCATION IN THE BASIC MEDICAL SCIENCES

Because of the importance of acquiring well-prepared teaching personnel in the basic medical sciences, the last few annual reports on Medical Education in the United States and Canada have included information about graduate programs offered in the basic medical sciences and the number of students enrolled in these programs. The sharp increase in the number of unfilled full-time faculty positions (table 17) makes this information

Table 17.—*Budgeted Unfilled Full-Time Faculty Positions in the United States (1954-1955 to 1957-1958)*

	1954-1955	1955-1956	1956-1957	1957-1958
Anatomy	25	18	22	45
Biochemistry	9	8	17	28
Physiology	16	15	21	35
Pharmacology	16	19	17	32
Microbiology	14	15	18	41
Pathology	27	33	46	58
Subtotal	107	108	141	239
Medicine	23	28	29	55
Surgery	19	22	42	44
Pediatrics	15	12	21	35
Obstetrics & gynecology	14	16	13	28
Psychiatry	30	21	29	55
Preventive medicine	17	14	19	44
Radiology	11	8	...	30
Anesthesiology	5	10	6	24
Others	17	12	31	65
Subtotal	151	143	190	380
Totals	258	251	331	619

TABLE 18.—*Advanced Degree and Postdoctoral Programs*

Programs and Enrollment

United States	Masters									Doctorates								
	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
Medical College of Alabama	4	5	..	2	✓	2	3	..	16	2	7	..	✓	..	1	2	..	12
University of Arkansas	..	13	..	1	..	3	1	..	18	..	..	..	..	..	1	1	..	2
College of Medical Evangelists	2	6	..	2	..	1	1	..	12	1	2	..	..	..	..	..	..	3
University of California, Los Angeles	2	✓	✓	5	..	7	1	..	15	13	14	6	5	..	✓	4	..	42
University of Southern California	✓	14	..	1	2	✓	16	..	33	✓	12	..	1	..	5	12	..	30
Stanford University	..	✓	✓	3	..	✓	1	..	4	1	✓	✓	14	..	1	9	..	25
University of California, San Francisco	6	..	..	..	..	9	6	..	21	8	17	..	..	..	1	16	..	42
University of Colorado	2	✓	✓	✓	7	1	3	..	13	3	1	✓	6	✓	2	5	..	17
Yale University	..	1	..	..	..	..	..	..	1	1	12	..	10	..	4	3	..	30
Georgetown University	1	..	..	2	1	1	2	..	7	1	4	..	4	2	10	6	..	27
George Washington University	4	12	..	7	..	7	18	..	48	4	15	..	25	..	9	7	..	60
Howard University	..	..	..	..	..	3	4	..	7	..	..	..	..	..	..	..	..	0
University of Miami	4	2	..	5	..	✓	✓	..	11	..	..	..	..	..	..	..	..	0
University of Florida	..	..	..	..	..	..	..	..	0	1	3	..	1	..	..	2	..	7
Emory University	3	3	..	✓	..	2	✓	..	8	1	4	..	✓	..	3	1	..	9
Medical College of Georgia	✓	✓	..	✓	✓	✓	✓	..	0	..	..	..	..	..	..	..	..	0
Chicago Medical School	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
Northwestern University	2	10	..	3	6	5	1	..	27	1	7	..	3	3	5	3	..	22
Stritch School of Medicine	5	9	..	5	..	2	5	..	26	6	7	..	2	..	5	6	..	26
University of Chicago	2	8	8	14	2	..	8	..	42	9	22	8	12	1	8	8	..	68
University of Illinois	8	10	..	7	2	6	11	..	44	3	13	..	2	✓	5	4	..	27
Indiana University	2	..	..	✓	..	..	1	..	3	3	..	..	1	..	..	✓	..	4
State University of Iowa	3	12	..	4	..	5	7	..	31	6	4	..	5	..	2	17	..	34
University of Kansas	8	2	..	9	..	1	4	..	24	6	5	..	1	..	1	3	..	16
University of Louisville	8	8	..	6	1	..	1	..	24	1	4	..	1	..	1	1	..	8
Louisiana State University	✓	3	..	✓	✓	..	1	..	4	✓	1	..	2	..	..	1	..	4
Tulane University	✓	4	..	5	..	3	✓	1	13	1	10	..	12	..	2	2	..	27
Johns Hopkins University	..	..	..	..	..	..	..	..	0	✓	2	✓	1	✓	✓	✓	✓	3
University of Maryland	..	..	..	..	..	..	..	..	0	4	6	..	3	..	2	..	..	15
Boston University	✓	5	..	5	✓	1	5	..	16	✓	6	..	2	✓	3	3	..	14
Harvard Medical School	..	1	..	..	..	..	..	..	1	✓	23	✓	11	1	1	3	..	39
Tufts University	..	..	..	..	..	..	..	..	0	..	8	..	..	..	4	3	..	15
University of Michigan	4	5	19	19	✓	2	5	..	54	7	12	20	20	✓	19	1	..	79
Wayne State University	✓	7	..	1	1	1	..	..	10	1	10	..	3	✓	3	..	..	17
University of Minnesota	12	18	6	36	24	13	15	..	124	..	✓	..	✓	..	..	..	..	0
University of Mississippi	✓	1	..	✓	2	1	3	..	7	✓	✓	..	1	..	1	1	..	3
University of Missouri	1	6	✓	7	..	..	4	..	18	✓	✓	✓	2	..	..	3	..	5
Saint Louis University	3	1	..	1	✓	✓	✓	..	5	1	20	..	1	..	..	..	..	22
Washington University	1	..	..	..	2	..	..	..	3	1	2	..	4	..	2	1	..	10
Creighton University	1	1	..	9	..	..	2	..	13	..	..	..	..	..	..	..	..	0
University of Nebraska	1	1	..	✓	✓	✓	2	..	4	1	1	..	✓	✓	✓	1	..	3
Dartmouth Medical School	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
Seton Hall College of Medicine and Dentistry	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
Albany Medical College	✓	2	..	✓	1	✓	✓	..	3	✓	8	..	2	✓	1	✓	..	11
University of Buffalo	..	✓	✓	4	..	3	✓	..	7	1	6	..	3	..	✓	6	..	16
Albert Einstein College of Medicine	..	..	..	..	..	..	..	..	0	2	5	..	✓	✓	4	1	..	12
Columbia University	..	..	..	..	..	..	..	..	0	10	14	..	4	..	2	5	..	35
Cornell University	1	✓	2	✓	✓	✓	✓	✓	3	✓	8	3	1	✓	✓	✓	6	18
New York Medical College	✓	✓	✓	✓	✓	✓	✓	✓	0	✓	✓	✓	✓	✓	✓	✓	✓	0
New York University	1	2	..	..	1	..	..	..	4	2	6	..	..	3	✓	..	..	11
State University of New York, Downstate Medical Center, New York City	1	..	..	..	..	..	1	..	2	3	3	..	✓	..	6	3	..	15
University of Rochester	✓	3	32	4	✓	3	1	..	43	2	12	15	5	2	5	7	..	48
State University of New York, Upstate Medical Center, Syracuse	✓	✓	..	1	..	✓	1	..	2	✓	3	..	1	..	3	3	..	10
University of North Carolina	✓	2	..	9	3	..	1	..	15	✓	3	..	4	..	..	3	..	10
Duke University	6	..	..	..	..	..	2	..	8	4	18	..	2	..	2	3	..	29
Bowman-Gray School of Medicine	1	✓	..	2	..	1	2	..	6	..	..	..	..	..	..	..	..	0
University of North Dakota	2	1	..	2	✓	✓	2	..	7	..	2	..	..	..	..	..	..	2
University of Cincinnati	✓	✓	..	..	✓	✓	✓	..	0	4	2	..	✓	✓	1	3	..	10
Western Reserve University	..	✓	..	..	..	..	..	..	0	4	15	..	7	3	2	13	..	44
Ohio State University	17	3	..	..	4	..	12	..	36	8	6	..	..	3	..	15	..	32
University of Oklahoma	1	3	..	4	1	1	3	..	13	2	7	..	6	2	2	2	..	21
University of Oregon	5	7	..	1	✓	6	6	..	25	✓	✓	..	✓	✓	✓	✓	..	0
Hahnemann Medical College	4	1	..	3	✓	2	1	..	11	✓	2	..	1	✓	1	✓	..	4
Jefferson Medical College	..	..	..	1	..	5	4	..	10	..	1	..	3	..	6	6	..	16
Temple University	✓	1	..	2	..	..	2	..	5	✓	✓	..	✓	..	✓	✓	..	0
University of Pennsylvania	✓	1	✓	9	✓	✓	4	..	14	6	18	4	41	2	2	15	..	88
Woman's Medical College of Pennsylvania	✓	✓	..	✓	✓	✓	✓	..	0	✓	✓	..	✓	✓	✓	✓	..	0
University of Pittsburgh	..	12	..	2	✓	5	..	..	19	1	5	..	3	✓	1	..	..	10
University of Puerto Rico	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0

*and Enrollments in the Basic Medical Sciences**

Postdoctorates									Degrees Awarded, 1957-1958																	
									Masters†									Doctorates								
Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
..	..	..	..	..	..	..	..	0	..	2	..	1	..	1	1	..	5	..	2	..	..	..	2	1	..	5
..	..	..	..	..	..	..	..	0	..	2	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	1
..	..	..	..	..	..	..	..	0	..	5	..	1	..	..	1	..	7	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	3
√	√	..	√	√	1	√	..	1	..	1	..	2	..	..	..	..	3	..	7	..	1	..	1	..	..	9
..	..	..	..	..	..	..	..	0	..	..	..	4	..	..	..	..	4	..	..	..	3	..	..	..	..	3
..	..	..	..	..	1	..	..	1	..	1	..	..	..	1	2	..	4	2	3	..	..	..	1	1	..	7
..	..	..	..	..	..	..	..	0	..	1	..	..	2	1	..	..	4	..	1	..	4	..	..	1	..	6
..	2	..	6	8	6	3	..	25	..	1	..	..	..	..	..	..	1	..	2	..	2	..	..	..	..	4
..	..	..	..	..	..	..	..	0	..	..	..	2	..	..	1	..	3	..	1	..	..	1	..	3	..	5
..	..	..	..	..	..	..	..	0	1	8	..	7	..	2	5	..	23	..	3	..	6	..	2	3	..	14
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	0
3	2	..	2	..	..	1	..	8	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
1	1	..	1	..	2	1	..	6	1	..	..	..	..	..	1	..	2	..	2	..	1	..	..	..	..	3
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	.	..	..	.	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	..	..	1	1	3	..	..	6	..	1	..	..	1	..	1	..	3
..	..	..	..	..	..	..	..	0	3	2	..	2	..	..	1	..	8	..	..	..	1	..	2	1	..	4
..	..	..	..	..	..	..	..	0	..	..	.	1	2	..	4	..	7	4	3	..	1	..	5	2	..	15
√	√	..	√	√	√	√	..	0	1	4	..	1	..	3	4	..	13	.	1	..	1	1	2	3	..	8
..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	2
1	2	..	..	..	3	3	..	9	..	1	..	3	..	2	3	..	9	2	4	..	5	..	2	6	..	19
..	..	..	..	..	..	..	..	0	.	..	..	2	..	..	..	..	2	1	..	..	..	..	..	1	..	2
..	√	..	..	..	..	3	..	3	1	2	..	1	..	..	..	..	4	..	..	..	..	..	1	..	..	1
..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	√	0	..	1	..	5	..	..	..	..	6	..	..	..	5	..	..	..	..	5
√	√	√	√	√	√	√	√	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1
√	√	..	√	√	√	√	..	0	..	3	..	2	..	..	..	..	5	..	2	..	2	..	3	2	..	9
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	..	..	1	..	7	2	..	..	1	1	..	11
..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	0	..	..	..	..	..	2	1	..	3
..	..	..	..	..	..	..	..	0	2	2	..	6	..	..	2	..	12	4	..	..	1	..	2	..	..	7
1	2	..	√	√	√	..	..	3	..	..	..	..	..	..	..	..	0	..	1	..	..	..	1	..	..	2
..	..	..	..	..	..	..	..	0	1	1	1	3	2	1	5	..	14	..	1	..	4	..	..	..	..	5
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
√	√	√	√	√	..	√	..	0	..	..	..	1	..	..	4	..	5	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	2	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	1
..	3	..	6	1	6	2	..	18	1	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	1
..	..	..	..	1	..	..	..	1	..	1	..	5	..	..	1	..	7	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	1	..	2	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	1	..	..	..	..	..	1	..	3	..	..	..	..	1	..	4
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	4	..	2	..	..	..	..	6
..	..	..	..	..	..	..	..	0	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	0	1
√	√	√	√	√	√	√	√	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	2	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	3	..	..	..	..	3	..	1	18	1	..	1	2	..	23	..	3	1	1	1	2	3	..	11
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	0
√	2	..	1	..	..	√	..	3	..	..	..	2	..	..	..	..	2	..	1	..	1	..	..	..	..	2
..	5	..	1	..	1	..	..	7	1	..	..	..	..	.	..	..	1	2	4	..	1	..	..	..	..	7
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	1	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	2	..	1	..	..	2	..	6	..	1	..	..	..	..	..	..	1
√	√	..	..	√	1	√	..	1	..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	1	..	2
..	6	..	4	6	2	3	..	21	..	1	..	..	..	..	..	..	1	1	3	..	2	..	..	..	..	6
..	2	..	..	3	..	..	..	5	7	1	..	..	3	..	5	..	16	1	1	..	..	..	..	4	..	6
..	..	.	..	..	..	..	..	0	..	1	..	1	1	..	1	..	4	..	1	..	3	3	..	..	..	7
..	..	..	..	..	..	..	..	0	2	4	..	..	..	..	1	..	7	..	2	..	..	..	..	..	..	2
..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	1	..	3	..	1	..	1	..	1	..	..	3
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	1	..	1
..	..	..	..	√	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	2	..	1	..	3
3	√	22	..	4	√	√	√	29	..	1	..	6	2	..	1	..	10	..	2	1	12	..	1	2	..	18
..	..	..	..	√	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0

TABLE 18.—*Advanced Degree and Postdoctoral Programs*

	Programs and Enrollment																	
	Masters									Doctorates								
	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
Medical College of South Carolina	2	✓	..	✓	..	5	1	..	8	4	✓	..	✓	..	✓	1	..	5
State University of South Dakota	..	3	..	3	..	..	1	..	7	..	..	..	..	..	1	..	..	1
University of Tennessee	✓	7	..	2	2	2	3	..	16	3	5	..	1	2	4	12	..	27
Meharry Medical College	..	✓	..	✓	..	..	✓	..	0	..	..	..	..	..	..	..	..	0
Vanderbilt University	✓	1	..	✓	✓	1	✓	..	2	✓	5	..	1	✓	2	1	..	9
Southwestern Medical School	1	1	..	3	..	..	..	..	5	.	1	..	2	..	..	..	..	3
University of Texas, Medical Branch	4	1	..	2	✓	✓	2	..	9	2	✓	..	1	..	2	4	..	9
Baylor University	10	10	..	2	..	1	7	..	30	3	7	..	6	..	..	1	..	17
University of Utah	3	✓	..	7	..	✓	..	..	10	6	12	..	12	..	5	..	..	35
University of Vermont	..	1	..	..	..	2	1	..	4	..	✓	..	..	..	..	..	..	0
University of Virginia	1	2	..	1	..	..	1	..	5	..	2	..	1	..	..	..	..	3
Medical College of Virginia	3	3	..	✓	✓	..	1	..	7	1	..	1	..	✓	3	1	..	6
University of Washington	2	1	..	13	..	2	2*	..	20	1	18	..	12	..	6	18	..	55
West Virgina University	..	2	..	4	..	1	..	..	7	..	..	..	..	..	..	..	..	0
University of Wisconsin	4	..	..	4	..	11	1	..	20	2	8	..	5	..	12	6	..	33
Marquette University	7	1	..	3	8	✓	10	..	29	1	1	..	✓	✓	✓	2	..	4
Totals	165	239	67	247	70	127	203	1	1,119	159	457	57	279	24	174	260	6	1,416
Canada																		
University of Alberta	✓	4	✓	1	✓	✓	1	..	6	..	✓	..	..	..	..	..	..	0
University of British Columbia	1	7	..	..	..	1	2	..	11	✓	2	..	..	..	1	✓	..	3
University of Manitoba	..	4	..	..	2	3	3	..	12	..	1	..	..	..	..	..	..	1
Dalhousie University	..	2	..	2	..	..	..	..	4	..	1	..	2	..	3	..	..	6
Queen's University	..	3	..	2	1	1	3	..	10	..	1	..	1	..	..	1	..	3
University of Ottawa	1	1	..	..	✓	..	✓	..	2	1	1	..	..	..	..	..	..	2
University of Western Ontario	1	5	..	..	1	..	1	..	8	..	3	3	3	1	..	2	..	12
University of Toronto	..	3	..	3	..	2	5	..	13	2	10	..	..	..	3	8	..	23
McGill University	1	4	..	3	✓	1	6	..	15	3	35	..	4	4	✓	4	..	50
University of Montreal	..	2	..	2	..	..	1	..	5	..	1	..	2	..	..	..	..	3
Laval University	✓	1	✓	1	✓	✓	✓	..	2	✓	2	✓	1	✓	✓	✓	..	3
University of Saskatchewan	..	1	..	✓	2	..	..	..	3	1	1	..	..	1*	..	1	..	4
Totals	4	37	..	14	6	8	22	0	91	7	58	3	13	6	7	16	0	110

* Check (✓) indicates an authorized program in which no students were enrolled during the year reported.

† An unknown number of these may be for doctoral degrees, since level of work was not specified.

ever more pertinent. It is to be remembered that general university departments in the biological fields offer graduate programs which serve as another source of teachers and investigators for medical school departments of basic sciences. Data in regard to such general university graduate programs are not available for reporting here. The study of the National Academy of Sciences–National Research Council described elsewhere will bring further understanding of present resources and future potentials for career teachers and investigators in medicine.

In table 18 are presented data for each school showing by basic science discipline the numbers of students enrolled who are working toward the masters or doctoral degree and postdoctoral students who are doing advanced study after having acquired a doctoral degree. Where checks (✓) appear in the table, the programs indicated are offered, but no students were enrolled during the year concerned. Table 18 also presents by school and by discipline the number of advanced degrees awarded in the basic medical sciences during the academic year 1957-1958.

Though not striking, there has been an increase in the total number of students working toward doctoral degrees in the basic sciences (table 19). Such a trend is not evident in enrollment figures for programs leading to the masters degree.

At the masters degree level, the largest number of enrollments occurred in microbiology, followed by biochemistry and physiology. At the doctoral level the largest enrollment was in biochemistry, followed by microbiology and physiology. The greatest number of both masters and doctoral degrees awarded was in microbiology, with biochemistry and physiology following in order.

TABLE 19.—*Enrollment in United States Graduate Programs in Basic Medical Sciences, 1955-1958*

	1955-1956	1956-1957	1957-1958
Masters	1,119	920	1,118
Doctoral	1,268	1,304	1,416
Postdoctoral	...*	192	219

* Data not collected for 1955-1956.

Information concerning graduate programs offered, students enrolled and graduate degrees awarded in the basic medical sciences by Canadian *and Enrollments in the Basic Medical Sciences**—Continued*

									Degrees Awarded, 1957-1958																	
Postdoctorates									Masters†									Doctorates								
Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
..	..	..	..	..	..	..	..	0	..	..	..	..	..	1	1	..	2	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	1	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	1	..	..	1	..	1	..	4	..	2	..	..	..	..	1	..	3
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
2	2	..	√	√	1	5	..	10	..	1	..	1	..	..	..	..	2	..	1	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	2	..	4
..	..	..	..	..	..	..	..	0	2	1	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	0
..	9	..	..	..	4	2	..	15	2	1	..	1	..	..	..	..	4	1	1	..	5	..	..	..	..	7
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	1	..	..	1
..	9	..	..	..	..	16	..	25	..	1	..	3	..	..	1	..	5	..	2	..	5	..	1	1	..	9
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
√	3	17	2	..	√	..	..	22	2	..	..	3	..	..	1	..	6	2	..	4	5	..	2	1	..	14
..	..	..	..	..	..	..	..	0	1	..	..	1	1	..	2	..	5	..	..	..	..	..	..	..	..	0
11	52	39	26	23	28	40	0	219	36	61	21	75	15	16	58	0	282	30	75	8	77	9	38	45	0	282
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	6	..	..	..	1	2	..	9	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	2	..	3	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	2	..	..	..	1	1	..	4	..	..	..	..	..	..	..	..	0
1	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	..	2	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	..	..	1	..	4	2	2	..	..	1	..	9
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	3	..	3	..	..	..	..	..	4	2	..	6
..	..	..	..	..	..	..	..	0	..	6	..	1	..	1	2	..	10	1	13	..	3	..	2	..	..	19
..	..	..	..	..	..	..	..	0	..	1	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	0
√	1	√	√	√	√	√	..	1	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
1	..	..	2	..	..	1	..	4	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1
2	1	0	2	0	0	1	0	6	0	18	0	3	1	3	13	0	38	3	17	2	5	0	6	3	0	36

schools are presented as part of table 18. Since this information was not available for previous years, it is not possible to draw comparisons.

TEACHING RESPONSIBILITIES FOR OTHER THAN MEDICAL STUDENTS

All of the medical schools in the United States, except one of the newly developing schools, have teaching responsibilities for students in addition to those in the basic medical educational program. In the case of eight schools, the additional teaching responsibilities include only interns and residents and in the case of three, include only practicing physicians in continuation education. The remaining 76 schools have responsibility for students in dentistry; nursing; pharmacy; x-ray and medical technology; arts and sciences courses; and such other students as those in physical therapy, occupational therapy, medical records, and medical librarianship in addition to medical students in the basic four year program, medical graduates in internships and residencies in the teaching hospitals of the schools, and physicians in continuing or postgraduate medical education programs.

Table 20 presents by school and student classification the educational responsibilities reported by the medical schools in the United States and Canada for students other than medical students in the basic program. Omitted from the table is a column portraying the number of enrollments by physicians in postgraduate courses inasmuch as the numbers reported did not appear to have a comparable base and thus did not seem to present an accurate picture of that educational responsibility.

The additional teaching responsibilities of the medical schools continue to increase each year. For the United States, such other students totaled at least 44,100, plus at least 20,500 physician enrollments in continuation courses. This represents a total of more than twice the number of medical students in the basic four year program. As has been pointed out previously, the totals given for other than medical students probably represent less than minimum real figures of the additional teaching responsibilities. For instance, a number of schools reporting zero nursing or arts and sciences students added that medical school faculty teach students in schools of nursing, social welfare, public health, as well as participate in the arts and sciences college programs. Only those interns in the one or two hospitals most closely related to each medical school are included, although some faculty time must be spent with interns and residents in other hospitals affiliated with the medical schools.

A major additional teaching responsibility, that of physicians in postgraduate educational programs, is omitted from the table because the figures did not seem, on the basis of other information the Council has, to have a comparable base among the schools. It will be recalled that in the Fifty-seventh Annual Report[30] a year ago, the analysis of 1,054 postgraduate courses in the 1956-1957 year showed

TABLE 20.—*Teaching Responsibilities for*

		Undergraduates or Basic Professional, No. Enrolled							Professional, No. Enrolled (Not Candidates for Advanced Degree)	
	Medical Schools in The United States	Dental Students	Pharmacy Students	Nurses	Technical Students	Arts and Science Majors	Other	Candidates for Advanced Degrees, No. Enrolled	Interns	Residents
1	Medical College of Alabama	185	0	159	60	0	17	28	26	110
2	University of Arkansas School of Medicine	0	0	0	15	0	22	20	15	56
3	College of Medical Evangelists	196	0	147	17	0	25	15	87	157
4	University of California School of Medicine, Los Angeles	0	0	0	12	0	13	57	25	110
5	University of Southern California School of Medicine, Los Angeles	0	80	0	0	80	0	64	152	200
6	Stanford University School of Medicine	0	0	95	22	46	14	29	43	131
7	University of California School of Medicine, San Francisco	287	275	191	55	0	37	64	43	256
8	University of Colorado School of Medicine	0	0	190	12	31	10	30	48	178
9	Yale University School of Medicine	0	0	42	0	6	27	56	52	106
10	Georgetown University School of Medicine	359	0	191	0	0	38	34	10	130
11	George Washington University School of Medicine	0	45	0	0	164	0	108	23	49
12	Howard University College of Medicine	225	108	33	16	5	7	7	12	61
13	University of Florida College of Medicine	0	0	0	0	2	0	15	0	0
14	University of Miami School of Medicine	0	0	213	17	0	0	11	65	168
15	Emory University School of Medicine	303	0	109	24	0	9	23	53	132
16	Medical College of Georgia	0	0	0	1	0	0	0	3	80
17	Chicago Medical School	0	0	0	0	0	0	0	10	12
18	Northwestern University Medical School	0	0	250	38	0	0	49	31	226
19	Stritch School of Medicine of Loyola University	5	0	0	0	0	0	52	6	27
20	University of Chicago, The School of Medicine	0	0	0	0	0	0	110	42	172
21	University of Illinois College of Medicine	170	193	22	0	0	26	71	36	127
22	Indiana University School of Medicine	137	0	287	57	863	0	7	20	124
23	State University of Iowa College of Medicine	132	99	146	32	264	35	74	20	160
24	University of Kansas School of Medicine	0	0	149	70	0	0	40	22	122
25	University of Louisville School of Medicine	167	0	71	15	27	16	35	29	123
26	Louisiana State University School of Medicine	0	0	23	0	0	8	9	52	140
27	Tulane University of Louisiana School of Medicine	0	0	366	16	0	131	40	52	128
28	Johns Hopkins University School of Medicine	0	0	0	0	0	0	3	144	85
29	University of Maryland School of Medicine and College of Physicians and Surgeons	0	55	50	0	0	8	15	30	133
30	Boston University School of Medicine	0	0	60	8	118	0	30	0	0
31	Harvard Medical School	56	0	0	0	0	0	40	95	540
32	Tufts University School of Medicine	200	0	0	0	0	0	17	40	112
33	University of Michigan Medical School	342	114	615	76	52	133	133	51	323
34	Wayne State University College of Medicine	0	0	0	25	0	0	30	66	131
35	University of Minnesota Medical School	285	51	93	432	304	266	124	38	170
36	University of Mississippi School of Medicine	0	0	44	0	0	15	10	23	43
37	University of Missouri School of Medicine	0	0	187	0	551	508	23	0	23
38	Saint Louis University School of Medicine	131	0	229	98	0	0	27	19	55
39	Washington University School of Medicine	0	0	0	91	0	0	31	184	52
40	Creighton University School of Medicine	90	28	107	0	0	0	14	10	18
41	University of Nebraska College of Medicine	0	0	111	20	0	0	7	7	29
42	Dartmouth Medical School	0	0	143	25	6	11	0	16	56
43	Seton Hall College of Medicine and Dentistry	81	0	0	0	0	0	0	0	0
44	Albany Medical College of Union University	0	0	185	21	0	15	14	64	90
45	University of Buffalo School of Medicine	120	112	140	30	12	0	23	43	125
46	Columbia University College of Physicians and Surgeons	76	0	371	0	0	260	35	27	201
47	Cornell University Medical College	0	0	69	23	0	0	21	73	197
48	Albert Einstein College of Medicine of Yeshiva University	0	0	0	0	0	0	12	52	145
49	New York Medical College, Flower and Fifth Avenue Hospitals	0	0	172	0	0	0	0	0	125
50	New York University College of Medicine	0	0	0	0	0	0	15	64	412

total physician enrollments of 34,913. Since 58.9% of the courses and 58.1% of the course hours occurred in medical schools or their teaching hospitals, there were probably at least 20,500 physician enrollments in these courses for a total of 31,094 course hours. Considering that medical school faculty personnel are involved in teaching in a majority of all postgraduate courses including those outside the medical school itself, this teaching responsibility is an important one not portrayed in the table 20 for the 1957-1958 year.

Other than Medical Students, 1957-1958

	Undergraduates or Basic Professional, No. Enrolled							Professional, No. Enrolled (Not Candidates for Advanced Degree)	
	Dental Students	Pharmacy Students	Nurses	Technical Students	Arts and Science Majors	Other	Candidates for Advanced Degrees, No. Enrolled	Interns	Residents
51 State University of New York Downstate Medical Center, New York City	0	0	0	0	0	0	17	216	351
52 University of Rochester School of Medicine and Dentistry	0	0	292	31	122	14	94	53	117
53 State University of New York Upstate Medical Center, Syracuse	0	0	84	0	0	0	12	29	111
54 University of North Carolina School of Medicine	196	121	124	35	2	0	28	30	89
55 Duke University School of Medicine	0	0	292	10	0	23	44	57	161
56 Bowman Gray School of Medicine of Wake Forest College	0	0	184	22	0	20	6	12	69
57 University of North Dakota School of Medicine	0	0	152	59	66	0	9	0	0
58 University of Cincinnati College of Medicine	0	0	0	0	0	0	11	52	135
59 Western Reserve University School of Medicine	189	0	200	18	0	0	65	58	220
60 Ohio State University College of Medicine	380	51	274	168	135	1,053	73	42	181
61 University of Oklahoma School of Medicine	0	0	151	18	0	0	34	19	77
62 University of Oregon Medical School	0	0	390	24	0	16	25	28	79
63 Hahnemann Medical College and Hospital of Philadelphia	0	0	62	19	0	0	15	9	58
64 Jefferson Medical College of Philadelphia	0	0	267	0	0	0	26	22	95
65 Temple University School of Medicine	0	0	277	26	0	0	5	15	128
66 University of Pennsylvania School of Medicine	139	0	39	133	0	0	131	50	281
67 Woman's Medical College of Pennsylvania	0	0	73	0	0	1	0	13	28
68 University of Pittsburgh School of Medicine	9	0	107	0	0	0	29	12	236
69 University of Puerto Rico School of Medicine	29	0	47	56	0	0	0	24	40
70 Medical College of South Carolina	0	105	189	9	0	0	13	29	63
71 University of South Dakota School of Medicine	0	0	21	3	111	0	8	0	0
72 University of Tennessee College of Medicine	149	176	30	42	0	8	43	48	87
73 Meharry Medical College	117	0	99	10	0	0	0	14	28
74 Vanderbilt University School of Medicine	0	0	0	0	0	0	21	33	74
75 University of Texas Southwestern Medical School	0	0	84	0	0	0	8	32	96
76 University of Texas Medical Branch	0	0	358	53	0	0	18	36	159
77 Baylor University College of Medicine	0	0	27	0	0	0	47	46	193
78 University of Utah School of Medicine	0	38	60	12	170	0	60	29	68
79 University of Vermont College of Medicine	0	0	54	23	0	0	4	20	38
80 University of Virginia School of Medicine	0	0	352	4	0	0	8	34	88
81 Medical College of Virginia	271	209	103	139	0	14	13	55	105
82 University of Washington School of Medicine	253	109	474	150	994	98	100	41	109
83 West Virginia University School of Medicine	30	59	0	13	0	0	7	0	0
84 University of Wisconsin Medical School	0	170	101	327	0	0	94	16	85
85 Marquette University School of Medicine	224	0	0	220	0	0	33	36	125
Totals	5,533	2,201	10,252	2,952	4,131	2,898	2,773	3,233	10,127
Medical Schools in Canada									
1 University of Alberta Faculty of Medicine	109	80	36	70	122	30	6	19	39
2 University of British Columbia School of Medicine	0	40	170	32	50	34	14	52	80
3 University of Manitoba Faculty of Medicine	0	0	400	0	0	0	13	50	40
4 Dalhousie University Faculty of Medicine	37	43	54	0	30	16	10	56	52
5 Queen's University Faculty of Medicine	0	0	20	0	5	12	13	13	14
6 University of Ottawa Faculty of Medicine	0	0	0	0	0	0	5	39	12
7 University of Western Ontario Faculty of Medicine	0	0	111	0	0	0	20	0	0
8 University of Toronto Faculty of Medicine	155	173	32	70	76	366	36	144	0
9 McGill University Faculty of Medicine	142	0	100	0	275	117	65	75	311
10 University of Montreal Faculty of Medicine	87	122	0	65	0	159	8	110	0
11 Laval University Faculty of Medicine	0	0	300	41	4,700	0	6	121	0
12 University of Saskatchewan College of Medicine	0	69	143	25	13	41	11	12	45
Totals	530	527	1,366	303	5,271	775	207	691	593

If one assumes that the schools were at least as active in courses for practicing physicians in 1957-1958 as was ascertained in the previous year, four categories of other than medical students account for more than two-thirds of the additional educational responsibility in United States schools in 1957-1958. These were physician enrollments in postgraduate continuation courses (at least 20,500), student nurses (10,252), residents (10,127), and arts and science majors (4,131). It should be pointed out that the numbers in the first and last categories just mentioned represent enrollments rather than individuals.

Relative to their total number of medical students in the basic four-year programs, the 12 Canadian medical schools had a proportionately larger educational responsibility for other students than did United States schools. In Canada, the other than medical students totalled 10,263, not counting the 413 students in premedical college work for whom three medical faculties (Queen's, Ottawa, and Toronto) had responsibility. The other students comprise almost three times the 3,685 medical students, not including physicians in continuation courses for which information was not comparable. The single group comprising about one-half of the other students were arts and science majors (5,271), while student nurses made up the next largest category (1,366).

The large numbers of other students for whom medical schools have educational responsibilities in addition to those imposed by medical students have significant implications on the personnel, budget, and facility needs of the schools. Unless these needs take into account the total teaching, research, and service responsibilities of each school, the educational value of any or all of the programs may be impaired.

SUPPLY OF ANATOMIC MATERIAL

The questionnaire this year to the medical schools included specific inquiry about the adequacy of supply of cadavers. In reply, although 72 schools indicated that the supply was adequate for the teaching needs of first year medical students, 13 of the 72 schools expressed reservations regarding the total adequacy of their anatomic material. Seven schools stated that the supply was barely or minimally adequate, one suggesting poor quality of material. Four schools stated that the quantity was satisfactory for first-year students but that it was inadequate for teaching surgical anatomy, seniors, and postgraduate courses. Two schools noted that the limited amount of anatomic material available increased the number of students per cadaver more than was desired, i. e., five or six students per cadaver as compared to the desired four, or four students per cadaver in a school where a 2:1 ratio is preferred.

Of the 13 schools in nine states and territories reporting an inadequate supply of cadavers, 5 commented that the state and county welfare agencies are providing burial to an increasing extent for the indigent who have ever received public assistance in any amount, thus decreasing the supply of anatomic material from the unclaimed and indigent deceased.

Requests or will-contracts disposing of the body to the medical school were mentioned by 11 schools, 5 of them being in California and the others in Florida, Ohio, Pennsylvania, Texas, and Wisconsin. Six of the schools cited bequests of bodies as providing an increasing supply of cadavers. One school in California relies entirely on the willed body program. Another school in that state expects to be able to do likewise in two years. A third school, which requires 50 cadavers a year and which would need 1,500 will-contracts to meet that need, received new will-contracts in 1957-1958 at the rate of 10 each week.

Considering the trend toward diminution in supply of cadavers from the unclaimed indigent population as well as the unprecedented response by the public in meeting the need by bequest in those states having statutes enabling such will-contracts, it is to be hoped that additional states will act to give legal recognition of bequests of bodies to medical schools.

Another factor among the schools which reported without reservation an adequate supply of anatomic material was the establishment and maintenance of understanding of the needs of the school as well as good relationships with morticians, social welfare agencies, and other public officials concerned with the disposal of unclaimed bodies. The development of such insights and helpful interpersonal relationships appears to be an important approach for better assuring an adequate supply of anatomic material. A medical school in one state having a potentially effective supply through law, but a lack of implementation by public officials, undertook to communicate to those officials the importance to the public of securing cadavers in order that the medical school could continue to meet its responsibilities in the education of medical students, physicians, and the advancement of medical science. That school reported that the cadaver supply, which had been relatively inadequate until 1954-1955, improved substantially to such an extent that a two-year supply was on hand in 1957-1958.

With few exceptions, those schools in states having a state anatomic board or committee established to provide cadavers to medical and dental schools report no lack of anatomic material.

In Canada, 10 schools reported an adequate supply of anatomic material, though 4 of those schools expressed reservations. One stated the supply was barely adequate and another school reported that it was adequate "only recently." A third Canadian medical school reported a shortage of female cadavers. A fourth, which prefers four students to one cadaver, stated that the available supply permits only a 5:1 ratio. Neither of the two schools reporting an inadequate supply proffered an explanation. Only one Canadian school, the University of British Columbia, cited bequeathed bodies as a source of anatomic material.

SUPPLY OF ANIMAL MATERIAL

A sufficient supply of healthy animals of various kinds is important not only to the educational activities of a modern medical school but to its research as well. Specific inquiry of the medical schools was made for 1957-1958 regarding the availability of living animals. The responses present problems that should concern the practicing profession, medical educators, and all others interested in the humane treatment of dogs.

Three schools in the United States did not reply regarding the adequacy of animal material. Of the 82 schools replying, 12 stated that the supply was frankly inadequate, while 69 schools reported with reservations that the supply was adequate in 1957-1958. The reservations included "adequate for teaching but not for research," "barely adequate for present needs," high cost, unpredictable delivery with seasonal shortages or inadequacy on specific demand. Nine schools of the 69 reporting an "adequate but" supply had one or more of these reservations.

The 12 schools reporting a frankly inadequate supply, chiefly of dogs, commented that the activities of antivivisectionist groups and their control of humane societies and local dog pounds were a major cause of the difficulty. This necessitated purchase of dogs from distant vendors, resulting in the delivery of ill kept dogs that were initially costly as well as expensive in terms of restoring the animals to health and in the limitation of research requiring healthy animals. It would seem that if the humane societies were really primarily interested in the welfare of dogs, they would not adopt attitudes and policies that make it necessary for medical schools to secure dogs from distant sources. The shipping of animals who are initially ill kept certainly must contribute further to their misery. If humane societies are concerned with the comfort of dogs, cutting off a local supply of healthy, though unclaimed, animals can only result in their shipment without adequate provision for proper feeding and care by the dealers who secure them. On the other hand, medical schools must be concerned with the health, comfort, and feeding of their animals because the results of tests are meaningless when the animals used are ill at the outset or are subject to pain.

All 12 of the Canadian medical schools reported an adequate supply of animals in 1957-1958, although one school commented about the "prohibitive" cost.

MEDICAL STUDENTS

ENROLLMENTS

For the ninth consecutive year, the number of students enrolled in approved and newly developing medical schools in the United States has established a new record high. Complete enrollment data for the individual schools is shown in table 12. Comparative data for this and preceding years are presented in table 21. In order to provide a true picture of medical education in the United States, table 21 and subsequent tables, unless otherwise noted, contain additions in the appropriate columns of the students in the newly developing schools: the University of Florida College of Medicine, Seton Hall College of Medicine and Dentistry, and Albert Einstein College of Medicine of Yeshiva University.

Table 21.—*Schools, Students, and Graduates in the Medical and Basic Sciences Schools in the United States, 1931-1958*

	Schools	1st Year	2nd Year	3rd Year	4th Year	Total	Graduates
1930-1931	76	6,456	5,538	5,080	4,908	21,982	4,735
1931-1932	76	6,260	5,462	4,932	4,885	22,135	4,936
1932-1933	77	6,426	5,479	5,017	4,948	22,466	4,895
1933-1934	77	6,457	5,571	4,988	4,937	22,799	5,035
1934-1935	77	6,356	5,642	5,142	4,905	22,888	5,101
1935-1936	77	6,605	5,458	5,230	5,020	22,564	5,183
1936-1937	77	5,910	5,269	5,140	5,158	22,095	5,377
1937-1938	77	5,791	5,225	4,986	5,036	21,587	5,194
1938-1939	77	5,764	5,160	4,947	4,921	21,302	5,089
1939-1940	77	5,794	5,177	4,921	4,894	21,271	5,097
1940-1941	77	5,837	5,254	4,969	4,849	21,379	5,275
1941-1942	77	6,218	5,406	5,087	4,942	22,031	5,163
1942-1943	76	6,425	5,828	5,278	5,100	22,631	5,223
1943-1944	77	6,561	6,071	5,640	5,257	23,529	5,134
1944 (2nd Session)	77	6,648	6,140	6,084	5,794	24,666	5,169
1944-1945	77	6,523	5,979	5,700	5,826	24,028	5,136
1945-1946	77	6,060	5,750	5,751	5,655	23,216	5,826
1946-1947	77	6,564	5,575	5,767	5,994	23,900	6,389
1947-1948	77	6,487	5,758	5,154	5,340	22,739	5,543
1948-1949	78	6,688	6,194	5,702	5,086	23,670	5,094
1949-1950	79	7,042	6,344	6,079	5,638	25,103	5,553
1950-1951	79	7,177	6,690	6,263	6,056	26,186	6,135
1951-1952	79	7,436	6,864	6,577	6,195	27,076	6,080
1952-1953	79	7,425	7,063	6,725	6,475	27,688	6,668
1953-1954	80	7,449	7,068	6,983	6,727	28,227	6,861
1954-1955	81	7,576	7,104	6,957	6,946	28,583	6,977
1955-1956	82	7,686	7,174	6,893	6,886	28,639	6,845
1956-1957	85*	8,014	7,259	7,023	6,834	29,130	6,796
1957-1958	85†	8,030	7,504	7,051	6,888	29,473	6,861

* Includes schools in development.
† Includes schools provisionally approved.

As was also the case in the previous three years, the figures in table 12 for enrollments by class as well as the total enrollments include the special and part-time students. The numbers of these students are tabulated for each school in the column after the total enrollment, although they are distributed in the enrollment figures in the prior columns of the table. A later section of this report categorizes for the first time the kinds of activities of part-time and special students.

The median total enrollment in 1957-1958 was 321, compared with 330 last year and 335 in the 1955-1956 year. The average total enrollment was

TABLE 22.—*Number of Applicants and Completed Applications by School for Class First Entering 1957-1958**

	Size of Freshman Class	No. of Applications			Total Applications Filed by Applicants to Each School	Av. No. of Applications per Applicant
		Men	Women	Total		
Medical College of Alabama	81	276	21	297	1,453	4.9
University of Arkansas School of Medicine	93	177	3	180	274	1.5
College of Medical Evangelists	112	168	16	184	411	2.2
University of California School of Medicine, Los Angeles	49	542	43	585	3,957	6.8
University of Southern California School of Medicine, Los Angeles	67	610	37	647	4,847	7.5
Stanford University School of Medicine	62	479	34	513	3,943	7.7
University of California School of Medicine, San Francisco	79	384	27	411	2,837	6.9
University of Colorado School of Medicine	85	196	16	212	598	2.8
Yale University School of Medicine	79	917	76	993	8,679	8.7
Georgetown University School of Medicine	108	985	51	1,036	9,634	9.3
George Washington University School of Medicine	101	1,313	57	1,370	12,741	9.3
Howard University College of Medicine	103	495	39	534	2,815	5.3
University of Florida College of Medicine	51	307	12	319	2,134	6.7
University of Miami School of Medicine	79	215	13	228	1,002	4.4
Emory University School of Medicine	74	650	22	672	4,427	6.6
Medical College of Georgia	103	262	11	273	593	2.2
Chicago Medical School	73	1,059	31	1,090	11,358	10.7
Northwestern University Medical School	130	1,380	59	1,439	11,226	7.8
Stritch School of Medicine of Loyola University	88	797	33	830	5,814	7.0
University of Chicago, The School of Medicine	72	1,048	63	1,111	9,707	8.7
University of Illinois College of Medicine	190	511	38	549	2,422	4.4
Indiana University School of Medicine	158	477	28	505	2,189	4.3
State University of Iowa College of Medicine	120	198	5	203	429	2.1
University of Kansas School of Medicine	102	348	12	360	1,918	5.3
University of Louisville School of Medicine	103	250	12	262	969	3.7
Louisiana State University School of Medicine	125	282	16	298	811	2.7
Tulane University of Louisiana School of Medicine	134	1,013	36	1,049	7,407	7.1
Johns Hopkins University School of Medicine	74	820	80	900	8,032	8.9
University of Maryland School of Medicine and College of Physicians and Surgeons	93	327	10	337	2,584	7.7
Boston University School of Medicine	74	1,119	92	1,211	11,835	9.8
Harvard Medical School	114	1,190	87	1,277	9,598	7.5
Tufts University School of Medicine	114	795	45	840	7,391	8.8
University of Michigan Medical School	206	617	34	651	2,925	4.5
Wayne State University College of Medicine	75	386	22	408	1,437	3.5
University of Minnesota Medical School	131	336	21	357	1,293	3.6
University of Mississippi School of Medicine	80	180	9	189	521	2.8
University of Missouri School of Medicine	75	184	6	190	570	3.0
Saint Louis University School of Medicine	121	1,226	43	1,269	10,114	8.0
Washington University School of Medicine	86	1,476	61	1,537	12,381	8.1
Creighton University School of Medicine	77	765	22	787	6,203	7.9
University of Nebraska College of Medicine	87	228	11	239	776	3.2
Dartmouth Medical School	24	318	2	320	3,091	9.7
Seton Hall College of Medicine and Dentistry	80	998	44	1,042	9,957	9.6
Albany Medical College of Union University	63	1,060	46	1,106	11,596	10.5
University of Buffalo School of Medicine	84	769	32	801	8,096	10.1
Columbia University College of Physicians and Surgeons	120	1,528	151	1,679	14,272	8.5
Cornell University Medical College	84	1,209	116	1,325	11,751	8.9
Albert Einstein College of Medicine of Yeshiva University	98	1,086	53	1,139	11,883	10.4
New York Medical College, Flower and Fifth Avenue Hospitals	128	1,689	102	1,791	16,870	9.4
New York University College of Medicine	134	1,241	93	1,334	13,455	10.1
State University of New York Downstate Medical Center, New York City	153	1,229	91	1,320	12,960	9.8
University of Rochester School of Medicine and Dentistry	71	1,063	56	1,119	11,024	9.8
State University of New York Upstate Medical Center, Syracuse	86	1,051	42	1,093	10,810	9.9
University of North Carolina School of Medicine	69	267	17	284	1,443	5.1
Duke University School of Medicine	79	819	46	865	7,083	8.2
Bowman Gray School of Medicine of Wake Forest College	54	772	40	812	6,643	8.2
University of North Dakota School of Medicine	40	96	4	100	368	3.7
University of Cincinnati College of Medicine	93	1,024	27	1,051	8,410	8.0
Western Reserve University School of Medicine	82	1,286	86	1,372	10,472	7.6
Ohio State University College of Medicine	150	539	28	567	2,326	4.1
University of Oklahoma School of Medicine	160	250	12	262	942	3.6
University of Oregon Medical School	79	462	18	480	3,006	6.3
Hahnemann Medical College and Hospital of Philadelphia	108	1,107	44	1,151	9,289	8.1
Jefferson Medical College of Philadelphia	178	1,748	1	1,749	12,889	7.4
Temple University School of Medicine	136	1,451	83	1,534	12,139	7.9
University of Pennsylvania School of Medicine	128	1,545	79	1,624	13,669	8.4
Woman's Medical College of Pennsylvania	51	-0-	199	199	1,107	5.6
University of Pittsburgh School of Medicine	102	531	26	557	4,419	7.9
University of Puerto Rico School of Medicine	53	98	25	123	352	2.9
Medical College of South Carolina	80	194	9	203	386	1.9
University of South Dakota School of Medicine	46	247	16	263	1,962	7.5
University of Tennessee College of Medicine	220	537	18	555	1,451	2.6
Meharry Medical College	73	417	30	447	2,010	4.5
Vanderbilt University School of Medicine	53	736	28	764	6,766	8.9
University of Texas Southwestern Medical School	104	474	30	504	1,485	2.9
University of Texas Medical Branch	152	519	37	556	1,588	2.9
Baylor University College of Medicine	86	913	30	943	6,820	7.2
University of Utah School of Medicine	58	295	11	306	1,765	5.8
University of Vermont College of Medicine	51	351	22	373	2,912	7.8
University of Virginia School of Medicine	77	649	44	693	5,575	8.0
Medical College of Virginia	85	338	25	363	1,854	5.1
University of Washington School of Medicine	75	452	19	471	2,833	6.0
West Virginia University School of Medicine	40	127	9	136	458	3.4
University of Wisconsin Medical School	90	182	12	194	662	3.4
Marquette University School of Medicine	105	997	37	1,034	7,318	7.1
	8,030	57,652	3,294	60,946†	......	3.9‡

---

* Reference 31.

† Total number of applications filed by all applicants to all medical schools.

‡ Total number of individuals applying for entrance to Fall 1958 class was 15,791. Average applications per applicant were 3.9.

347, compared with 366 last year and 370 in the 1955-1956 year. The trend to smaller total classes noted last year appears to be supported by the current median and average. However, the students in the entirely newly developing schools more than compensate so that the number of total students is greater than ever.

Four schools each had a total enrollment of more than 600 (Tennessee, Michigan, Jefferson, and Illinois). Last year a fifth school, the University of Texas at Galveston, with an enrollment of 601, was also included in this group.

As was the case last year also, the University of Michigan and the University of Tennessee medical schools admitted more than 200 students into their entering classes in 1957-1958 (206 and 220 respectively). There were this year five additional schools with first-year enrollments of 150 or more students, though six schools were so categorized last year.

The total entering class was the largest yet enrolled (8,030), as tables 12 and 21 portray. However, there was not the large increase in 1957-1958 that occurred in 1956-1957 when the entering classes of the newly developing University of Florida and Seton Hall medical schools were included for the first time. Six schools had major changes in entering class size compared to the previous year; four increased and two decreased. The increases included Howard (33.3%), West Virginia (29%), College of Medical Evangelists (16.3%), and Miami (11.2%). The University of Texas at Galveston and Western Reserve University medical schools' first year classes decreased by 19.5% and 9.9% respectively. The median entering class numbered 86 students as compared with 84 in 1956-1957. The average first-year class in the four year schools was 97.2 compared with 94 in the previous year and 97 in 1955-1956.

TABLE 23.—*Number of Applicants to Medical Schools, 1948-1958**

Year	Individual Applicants, No.
1948-1949	24,242
1949-1950	24,434
1950-1951	22,279
1951-1952	19,920
1952-1953	16,763
1953-1954	14,678
1954-1955	14,538
1955-1956	14,937
1956-1957	15,918
1957-1958	15,791

* Reference 31.

Table 22, prepared by the Association of American Medical Colleges[31] lists by schools the number of applicants and applications to each of the schools for the 1957-1958 entering class. It should be noted that, although the numbers of men and women listed as applying to each school are individual applicants for each school, the over-all totals for the schools enumerate applications and not applicants. There were a total of 60,946 applications to all medical schools filed by 15,791 applicants, or an average of 3.9 schools applied to by each prospective medical student. For a complete and detailed study of applicants, applications, and acceptances for this class, the GEE study[31] should be consulted.

TABLE 24.—*Schools, Students, and Graduates in the Medical and Basic Science Schools in Canada, 1948-1958*

	Schools	1st Year	2nd Year	3rd Year	4th Year	Total	Graduates
1948-1949	10	887	765	842	739	3,233	679
1949-1950	10	897	798	761	822	3,278	791
1950-1951	11	960	880	844	805	3,489	858
1951-1952	11	873	891	858	836	3,458	783
1952-1953	11	918	809	865	852	3,444	825
1953-1954	12	982	901	844	916	3,643	896
1954-1955	12	968	903	881	837	3,589	894
1955-1956	12	1035	883	877	856	3,651	816
1956-1957*	12	1001	934	855	865	3,655	893
1957-1958	12	1012	916	928	830	3,686	828

*The remaining school of the basic medical sciences (Saskatchewan) became a four-year school with students in all years.

Although the number of applicants decreased a trifle in 1957-1958 compared to the preceding year, there was no significant change. The ratio of applicants (15,791) to places in the entering class (8,030) remained 1.9:1 as it was in the previous year. Table 23 presents the number of individual applicants to United States medical schools each year for the past 10 years.

The Canadian medical schools, as shown in table 13, also had in 1957-1958 a larger enrollment than previously of medical students, if the students in only the basic four-year program are counted each year to give comparable figures, excluding those in the premedical or required intern years. Comparative data for this and preceding years are presented in table 24. The median enrollment in 1957-1958 was 228 and the average 307, as compared with 224 and 304 in the previous year. Data on the applicants and applications to Canadian schools were not available for the 1957-1958 academic year in time for publication.

In 1957-1958, 82 United States citizens were enrolled in the first medical year in Canadian schools as compared with 4 Canadians enrolled in the first-year classes of United States medical schools. This is 10 fewer United States citizens in Canadian first-year medical classes than was the case in the 1956-1957 year. Even so, the favorable net balance of 78 United States citizens in the first medical year of Canadian schools represents the equivalent of another United States school having a class size larger than that of 28 of the United States medical schools.

ENROLLMENT OF WOMEN STUDENTS

Information by school on the number of men and women enrolled and graduated in the United States is shown in table 25. Woman's Medical

College enrolled only women, while Dartmouth and Jefferson continued to limit their enrollments to men. In 1957-1958, the 1,644 women enrolled comprised 5.57% of all enrollments, as compared to 1646 or 5.65% in 1956-1957. The proportion decreased slightly due chiefly to a larger total enrollment figure as only two fewer women were enrolled. The total women graduates increased, as predicted last year, by 25, comprising 5.1% of all graduates compared with 4.8% in the 1956-1957 class.

Excluding Woman's Medical College, the medical schools of four universities (University of Illinois, State University of New York in Brooklyn, Columbia University, and New York University), one more than in the previous year, each enrolled more than 40 women. Six other medical schools each enrolled more than 30 women: Howard, Harvard, Michigan, Western Reserve, Temple, and Tennessee. In five medical schools, women accounted for 10% or more of the enrollment: Howard, Boston University, New York University, Western Reserve, Puerto Rico. Women comprised 10% or more of the graduating class in four schools: Howard, Boston University, Wayne State, and Western Reserve.

The enrollments and graduates by sex in Canadian medical schools are also depicted in table 25. In 1957-1958, 259 women comprised 7.02% of the total enrollment, an increase of 23 or 917% over the 1956-1957 year. All 12 schools had women enrolled, although Queen's University had no women

TABLE 25.—*Distribution of Students and Graduates in the United States and Canada by Sex, 1957-1958*

	Students		Graduates	
United States	Men	Women	Men	Women
Medical College of Alabama	266	23	63	5
University of Arkansas	330	15	79	6
College of Medical Evangelists	367	17	91	5
University of California, Los Angeles	186	9	47	0
University of Southern California	253	11	57	3
Stanford University	222	12	50	4
University of California, San Francisco,	298	26	80	3
University of Colorado	294	24	75	4
Yale University	289	20	67	5
Georgetown University	392	15	97	3
George Washington University	361	22	86	4
Howard University	287	33	59	8
University of Miami	250	15	59	1
University of Florida	88	4	0	0
Emory University	272	6	65	1
Medical College of Georgia	372	14	92	1
Chicago Medical School	274	1	65	0
Northwestern University	497	22	128	3
Stritch School of Medicine	326	11	72	1
University of Chicago	265	23	67	3
University of Illinois	633	44	140	10
Indiana University	565	18	135	3
State University of Iowa	421	13	101	3
University of Kansas	396	16	103	4
University of Louisville	366	16	90	5
Louisiana State University	415	19	90	5
Tulane University	486	17	123	5
Johns Hopkins University	272	21	70	5
University of Maryland	344	11	77	1
Boston University	263	28	64	7
Harvard Medical School	482	30	125	10
Tufts University	409	21	104	5
University of Michigan	717	33	162	7
Wayne State University	267	15	65	7
University of Minnesota	468	21	107	6
University of Mississippi	245	8	42	2
University of Missouri	202	4	31	1
Saint Louis University	455	12	116	1
Washington University	332	12	84	3
Creighton University	276	7	63	1
University of Nebraska	315	12	82	1
Dartmouth Medical School	48	0	0	0
Seton Hall College of Medicine and Dentistry	148	9	0	0
Albany Medical College	221	8	58	2
University of Buffalo	290	14	75	3
Albert Einstein College of Medicine	230	15	0	0
Columbia University	428	42	106	9
Cornell University	314	20	77	4
New York Medical College	470	27	111	4
New York University	465	54	114	11
State University of New York, Downstate Medical Center, New York City	539	50	133	12
University of Rochester	276	7	71	2
State University of New York, Upstate Medical Center, Syracuse	286	14	69	2
University of North Carolina	250	7	55	3
Duke University	301	14	77	4
Bowman-Gray School of Medicine	190	14	48	1
University of North Dakota	76	2	0	0
University of Cincinnati	324	19	74	2
Western Reserve University	294	31	70	7
Ohio State University	554	18	137	2
University of Oklahoma	355	17	81	2
University of Oregon	276	16	66	4
Hahnemann Medical College	377	17	92	4
Jefferson Medical College	682	0	158	0
Temple University	461	34	112	6
University of Pennsylvania	490	19	118	8
Woman's Medical College of Pennsylvania	0	185	0	45
University of Pittsburgh	349	16	76	4
University of Puerto Rico	162	26	41	4
Medical College of South Carolina	294	11	73	2
State University of South Dakota	77	3	0	0
University of Tennessee	738	30	169	13
Meharry Medical College	245	22	55	2
Vanderbilt University	190	7	46	0
University of Texas, Southwestern	367	21	85	5
University of Texas, Galveston	545	28	143	8
Baylor University	309	12	75	3
University of Utah	205	2	48	0
University of Vermont	165	14	36	2
University of Virginia	276	14	63	3
Medical College of Virginia	334	23	93	4
West Virginia University	272	16	0	0
University of Washington	67	3	68	4
University of Wisconsin	298	22	70	6
Marquette University	373	20	90	6
Totals	27,829	1,644	6,506	355
Canada				
University of Alberta	204	10	45	2
University of British Columbia	195	19	44	3
University of Manitoba	214	12	43	2
Dalhousie University	210	13	53	3
Queen's University	209	14	45	0
University of Ottawa	219	18	55	2
University of Western Ontario	216	13	55	2
University of Toronto	526	53	106	13
McGill University	406	28	106	2
University of Montreal	406	35	111	2
Laval University	501	28	113	7
University of Saskatchewan	121	16	32	6
Totals	3,427	259	808	44

graduates. The number of women medical students enrolled in Canadian schools has increased each year for the past four years, although it has not yet approximated the 276 women enrolled (7.5%) in 1953-1954.

Women graduates in 1957-1958 numbered 44, or 5.16% of the total graduates, a decrease of 20 as compared with 1956-1957, and the smallest number absolutely and proportionately since the 1951-1952 year when there were 36 women or 4.6% of the graduates.

Four Canadian schools (Toronto, McGill, Montreal, Laval) each enrolled 25 or more women. An additional three schools (British Columbia, Ottawa, and Saskatchewan) each enrolled 15 or more women. Two schools, the University of Toronto and the University of Saskatchewan, each enrolled women as 10% or more of their classes.

GEOGRAPHICAL SOURCE OF ENTERING STUDENTS

The residence of students at the time of their enrollment in the medical schools in the United States are shown in table 26, based on enrollment data for 1957-1958 from the medical schools.

This table indicates that 41% of all first-year medical students came from six states (New York, Pennsylvania, California, Ohio, Illinois, and Texas), as has been true for the past two years. The first-year enrollment of the 32 schools in these states also represented 41% of the total enrollment for the nation. Almost 38% of all medical schools in the United States are located in the same six states.

There were fewer than 20 first-year medical students from each of five states (Nevada, Delaware, Wyoming, Maine, and New Mexico) and fewer than 30 students from each of five other states (New Hampshire, Idaho, Montana, Vermont, and Rhode Island). Of these 10 states, only New Hampshire and Vermont have medical schools. The 74 students from the five states supplying the fewest medical students and the 123 students from the five other states represented only 2.4% of the total first-year class, 10 students and 0.17% larger than in the 1956-1957 academic year.

Table 27 lists the states in ascending order according to the number of enrolled first-year medical students per 100,000 population. The six states with the largest number of first-year students are distributed throughout this list, with one-half having less than the median number of students per 100,000 population (4.5) and one-half having more than the median number. As was true last year also, with the exception of Vermont and Wyoming, the other eight states having the smallest number of first-year students enrolled in medical schools had fewer students than the median number.

The over-all ratio of students per 100,000 population, excluding members of the armed forces, is unchanged from the 4.7 of last year.

There were seven schools, all state-owned, that enrolled as first-year medical students only those resident in the state in which the school is located. This appears to be a marked improvement as compared to 12 such schools in the 1956-1957 year, until the data in table 28 is noted. This table presents nonresident enrollments by numbers of schools in various proportion categories as well as numbers of students involved in the publicly-owned schools, as compared with four years ago when a similar analysis was developed. It will be seen that there is no significant change in the number of schools restricting their nonresident enrollment to less than 10% of the class, or in the number of nonresident students enrolled by the publicly-owned schools. Not counting the seven schools enrolling no nonresident students, the median proportion of the entering classes consisting of nonresidents was 8.1% in the publicly-owned schools and 50.9% in the privately-owned schools. The respective averages were 10.4% and 53%. The 57th annual report on Medical Education in the United States and Canada[32] presented a summary of geographical restrictive policies of the medical schools based on statements to the Association of American Medical Colleges that year.

As table 29 shows, a total of 37 entering students in United States schools came from the territories and possessions of Canal Zone, Hawaii, and Puerto Rico, and one came from Alaska. The 38 students entered 24 medical schools. Hawaii with 20 students and Puerto Rico with 16 students contributed nearly all of the 38 students. Of these areas, only Puerto Rico has a medical school.

Table 30 presents the geographic source of first-year medical students in the Canadian medical schools in 1957-1958. It should be noted at the outset that 82 students came from the United States (while only 4 students from Canada entered United States schools), representing a balance favorable to the United States of 78 students, as compared to a favorable balance of 84 students in 1956-1957, as was pointed out in the section on enrollments. The 82 United States students were distributed among 11 of the 12 Canadian schools. As in previous years, the majority of United States citizens (51 in 1957-1958 compared to 47 in 1956-1957) enrolled in McGill University. The four United States schools each enrolling one Canadian student in 1957-1958 were the College of Medical Evangelists, the University of Chicago, Johns Hopkins University, and the University of Kansas.

With the exception of the University of Alberta Faculty of Medicine, all other Canadian medical schools enrolled in the first medical year students not resident in the province in which the school was located. The proportion of such students varies from 2.5% to 64.7% in the 11 schools enrolling such

TABLE 26.—*Geographical Source of Entering Students*

	School	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 District of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
1	Medical College of Alabama	74	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
2	University of Arkansas School of Medicine	..	..	93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	College of Medical Evangelists	..	..	..	76	..	..	..	1	2	..	..	1	..	3	..	..	..	..
4	University of California School of Medicine, Los Angeles	..	..	..	47	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	University of Southern California School of Medicine	..	..	..	61	..	..	..	..	..	..	..	..	..	..	..	..	1	..
6	Stanford University School of Medicine	..	2	..	36	..	1	..	..	..	..	..	..	..	1	1	..	..	..
7	University of California School of Medicine, San Francisco	..	..	..	77	..	..	..	..	..	..	1	..	..	..	..	..	..	..
8	University of Colorado School of Medicine	..	2	..	..	70	..	..	..	..	..	..	..	..	..	..	..	1	..
9	Yale University School of Medicine	..	1	..	5	1	12	..	..	1	..	..	..	1	2	..	..	..	1
10	Georgetown University School of Medicine	..	1	..	..	2	6	1	14	..	1	..	1	..	..	..	1	..	1
11	George Washington University School of Medicine	..	2	..	11	..	2	..	11	1	..	3	2	1	..	..	..	..	..
12	Howard University College of Medicine	1	..	1	6	..	3	..	11	2	2	..	1	..	1	..	1	..	..
13	University of Florida College of Medicine	..	..	..	..	..	2	..	..	43	..	..	2	..	..	..	..	..	..
14	*University of Miami School of Medicine*	..	..	..	1	..	..	..	..	75	1	..	..	..	..	..	..	..	..
15	Emory University School of Medicine	2	..	..	..	..	..	..	1	13	11	..	1	..	..	..	2	..	..
16	Medical College of Georgia	..	..	..	..	..	..	..	..	..	102	..	1	..	..	..	..	..	..
17	Chicago Medical School	..	..	..	3	..	1	..	1	..	..	..	6	..	..	..	..	..	..
18	Northwestern University Medical School	..	1	..	18	1	..	..	..	1	..	3	16	4	3	3	..	..	..
19	Stritch School of Medicine of Loyola University	1	..	..	2	..	..	..	..	..	..	..	41	7	1	2	..	..	..
20	University of Chicago, The School of Medicine	..	..	..	8	..	..	..	..	..	..	..	32	3	1	..	..	..	..
21	University of Illinois College of Medicine	..	1	..	..	..	..	..	..	..	..	..	188	..	..	..	..	..	..
22	Indiana University School of Medicine	1	..	..	..	..	..	..	..	..	..	..	2	146	..	..	..	..	1
23	State University of Iowa College of Medicine	..	..	..	..	..	..	..	..	..	..	..	4	..	113	..	..	..	..
24	University of Kansas School of Medicine	..	..	..	..	..	..	..	..	..	..	..	1	..	..	91	..	..	..
25	University of Louisville School of Medicine	..	..	..	1	..	1	..	..	..	..	..	1	3	..	..	90	..	..
26	Louisiana State University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	123	..
27	Tulane University of Louisiana School of Medicine	11	5	5	3	1	..	..	.	11	2	..	1	..	..	2	..	18	..
28	Johns Hopkins University School of Medicine	..	3	1	3	1	2	2	..	2	2	..	6	1	..	..	1	..	..
29	University of Maryland School of Medicine	..	..	..	2	..	1	..	1	..	..	..	..	1	..	..	..	..	..
30	Boston University School of Medicine	..	..	..	3	..	5	..	..	..	..	.	1	..	1	..	..	..	..
31	Harvard Medical School	1	..	1	4	..	3	..	..	2	..	..	3	2	3	1	..	1	3
32	Tufts University School of Medicine	..	..	..	1	..	19	..	..	1	..	..	..	..	..	..	..	..	2
33	University of Michigan Medical School	..	..	..	2	1	..	..	1	..	..	..	5	..	..	..	..	..	..
34	Wayne State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	University of Minnesota Medical School	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
36	University of Mississippi School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37	University of Missouri School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38	Saint Louis University School of Medicine	1	2	1	17	1	4	..	..	1	..	1	10	1	1	6	2	1	..
39	Washington University School of Medicine	2	1	..	7	1	..	..	..	2	..	2	11	3	2	1	1	..	..
40	Creighton University School of Medicine	..	..	..	13	..	1	..	..	..	..	3	1	..	10	2	..	..	..
41	University of Nebraska College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..
42	Dartmouth Medical School	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..
43	Seton Hall College of Medicine and Dentistry	..	..	..	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..
44	Albany Medical College of Union University	1	..	..	2	..	2	..	..	..	.	..	..	..	..	1	..	..	..
45	University of Buffalo School of Medicine	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
46	Columbia University College of Physicians and Surgeons	..	2	..	2	..	3	..	1	1	1	..	1	1	..	..	..	..	3
47	Cornell University Medical College	..	..	..	3	2	..	2	..	1	..	..	5	..	1	..	..	..	1
48	*Albert Einstein College of Medicine of Yeshiva University*	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
49	New York Medical College, Flower and Fifth Avenue Hospitals	..	..	..	..	..	8	..	1	1	..	..	1	..	..	..	..	..	..
50	New York University College of Medicine	..	..	..	2	..	4	..	1	..	..	..	2	..	..	..	..	..	..
51	State University of New York Downstate Medical Center, New York City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
52	University of Rochester School of Medicine and Dentistry	..	..	..	1	..	2	1	1	1	..	..	2	..	..	..	..	..	..
53	State University of New York Upstate Medical Center, Syracuse	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
54	University of North Carolina School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
55	Duke University School of Medicine	1	..	..	2	1	1	..	1	8	..	..	..	..	..	..	1	..	..
56	Bowman Gray School of Medicine of Wake Forest College	1	..	..	..	..	..	..	1	1	2	..	..	..	..	..	1	..	..
57	University of North Dakota School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	University of Cincinnati College of Medicine	..	1	..	3	..	..	1	1	.	..	..	4	..	..	..	2	..	..
59	Western Reserve University School of Medicine	1	1	..	..	..	..	..	1	1	..	..	1	3	..	..	..	..	..
60	Ohio State University College of Medicine	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
61	University of Oklahoma School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
62	University of Oregon Medical School	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..
63	Hahnemann Medical College and Hospital of Philadelphia	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..
64	Jefferson Medical College of Philadelphia	1	.	..	2	..	..	5	3	..	..	..	..	..	..	..	..	..	..
65	Temple University School of Medicine	..	..	..	1	..	2	..	..	..	..	..	2	..	..	..	..	..	..
66	University of Pennsylvania School of Medicine	1	..	..	5	..	3	1	1	1	1	..	3	..	..	..	..	..	1
67	Woman's Medical College of Pennsylvania	..	..	..	6	..	1	..	..	1	2	..	1	..	1	..	..	..	..
68	University of Pittsburgh School of Medicine	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..
69	University of Puerto Rico School of Medicine	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
70	Medical College of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71	State University of South Dakota School of Medicine	..	..	..	3	1	..	..	..	..	..	..	1	..	5	1	..	..	..
72	University of Tennessee College of Medicine	3	1	4	..	..	..	..	..	1	2	..	1	..	..	..	3	1	..
73	Meharry Medical College	8	..	..	1	..	1	..	1	3	5	..	1	..	..	..	..	3	..
74	Vanderbilt University School of Medicine	3	..	..	2	..	..	..	1	2	4	..	1	1	..	..	8	..	..
75	University of Texas Southwestern Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
76	University of Texas Medical Branch, Galveston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	Baylor University College of Medicine	1	3	..	7	..	..	..	..	..	..	..	..	1	..	1	..	..	1
78	University of Utah School of Medicine	..	3	..	1	..	..	1	..	..	..	3	..	..	..	..	..	..	..
79	University of Vermont College of Medicine	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	1
80	University of Virginia School of Medicine	..	..	..	..	..	2	2	3	2	..	..	..	..	..	..	..	..	..
81	Medical College of Virginia	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	1	..
82	University of Washington School of Medicine	..	2	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..
83	West Virginia University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84	University of Wisconsin Medical School	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
85	Marquette University School of Medicine	..	2	..	2	..	..	..	2	..	..	1	5	2	4	..	..	..	..
	Totals	115	36	106	466	84	102	17	60	183	171	23	404	181	157	113	115	150	16
	Marginal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

in Medical Schools of the United States, 1957-1958

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Territories and Possessions	Canada	Foreign	Home State	Out of State	Totals	Marginal Number
..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	..	..	..	74	7	81	1
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	93	0	93	2
2	1	1	..	..	..	..	..	1	..	..	..	..	1	1	1	1	2	1	..	1	..	..	..	..	..	..	3	..	..	..	1	1	11	76	36	112	3
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	47	2	49	4
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	64	3	67	5
..	2	..	1	..	..	..	..	..	..	..	1	2	..	1	2	1	..	..	..	..	..	1	2	1	..	..	1	..	1	1	..	..	4	36	26	62	6
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	2	79	7
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	70	15	85	8
1	6	1	2	..	..	..	..	..	..	12	..	21	1	..	2	..	1	2	3	..	..	..	1	..	..	..	1	..	..	..	1	..	..	12	67	79	9
1	15	2	..	..	..	..	..	..	..	11	..	30	..	..	1	..	..	13	3	..	..	..	..	..	..	3	..	..	..	..	..	..	1	14	94	108	10
14	3	2	1	..	1	3	..	..	..	9	..	11	1	1	6	1	1	2	..	..	..	..	..	2	..	4	1	3	1	..	1	..	..	11	90	101	11
4	2	4	..	2	2	..	..	..	..	5	..	18	3	..	4	3	1	7	..	2	..	2	2	..	..	3	..	1	..	..	..	..	9	11	92	103	12
..	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	43	8	51	13
..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75	4	79	14
..	..	1	..	2	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	..	3	1	..	..	..	..	..	..	..	..	..	1	41	33	74	15
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	102	1	103	16
..	..	..	..	..	..	..	..	..	..	2	..	59	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	67	73	17
..	1	3	2	..	1	3	..	..	..	4	1	6	..	..	11	1	..	..	..	..	1	..	1	3	..	..	2	1	8	..	1	..	..	46	84	130	18
..	2	3	1	..	..	..	..	..	..	2	..	4	..	..	10	..	..	3	..	..	..	..	..	2	..	..	1	..	1	..	1	..	1	44	44	88	19
1	..	1	1	..	..	1	1	..	..	1	..	7	..	2	1	1	1	..	..	..	..	..	1	..	..	1	1	1	2	1	1	1	1	32	40	72	20
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	188	2	190	21
..	..	1	..	..	..	..	..	..	..	2	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	146	12	158	22
..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	113	7	120	23
..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	91	11	102	24
..	..	..	..	..	1	..	..	..	..	3	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	90	13	103	25
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	123	2	125	26
..	2	..	1	24	4	1	..	..	..	1	1	..	..	..	1	5	..	3	1	..	1	2	17	..	..	..	..	..	1	1	2	..	7	18	116	134	27
6	4	..	2	2	1	..	..	..	..	8	..	7	1	..	3	1	..	1	..	1	1	..	4	..	..	6	1	..	..	..	..	1	..	6	68	74	28
63	..	..	..	..	..	..	..	..	..	1	..	3	3	..	2	..	1	5	1	..	..	1	..	..	1	..	1	1	1	1	3	..	..	63	30	93	29
1	34	1	..	..	..	..	..	..	..	3	..	21	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..	..	34	40	74	30
4	14	1	1	..	2	..	..	..	..	8	..	26	..	..	5	3	2	10	4	..	..	1	2	..	..	3	1	1	1	..	..	..	1	14	100	114	31
..	55	..	..	..	..	..	..	..	9	5	..	9	1	..	3	..	..	2	6	..	..	..	..	..	..	..	..	..	..	..	..	..	1	55	59	114	32
..	..	183	..	..	..	..	1	..	..	1	..	1	2	1	4	..	..	2	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	183	23	206	33
..	..	73	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	2	75	34
..	..	..	125	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	125	6	131	35
..	..	..	..	79	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	79	1	80	36
..	..	..	..	..	75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75	0	75	37
..	2	5	5	..	15	..	..	..	1	4	..	4	..	..	22	3	..	..	..	..	..	..	2	..	..	..	4	..	1	..	1	..	3	15	106	121	38
..	4	1	1	1	17	..	..	..	..	1	..	8	1	..	5	..	1	2	..	..	..	1	3	..	..	..	1	..	1	1	3	..	1	17	69	86	39
..	1	..	2	..	1	7	14	..	..	..	..	6	..	..	2	..	2	1	..	..	2	..	1	..	..	..	2	..	..	1	2	..	3	14	63	77	40
..	..	..	..	..	..	..	82	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	82	5	87	41
..	..	..	3	..	1	..	..	..	2	2	..	5	..	..	1	..	1	2	1	..	..	1	1	..	1	..	..	..	..	..	..	..	..	2	22	24	42
1	..	..	..	..	..	..	..	..	..	50	..	23	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	30	80	43
..	4	1	..	..	..	..	..	1	..	6	..	39	1	..	1	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	39	24	63	44
..	..	..	..	..	..	..	..	..	..	4	..	73	..	..	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	11	84	45
..	9	1	1	..	..	..	1	1	..	13	..	61	1	..	3	..	..	6	..	..	..	..	3	..	..	..	..	..	4	..	..	..	1	61	59	120	46
..	2	..	..	..	1	..	1	..	1	7	1	40	1	..	3	1	..	3	..	..	..	..	2	2	..	..	..	..	..	..	1	..	3	40	44	84	47
..	3	..	..	..	..	..	..	..	..	2	..	86	..	..	1	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	86	12	98	48
1	15	..	..	..	..	..	..	..	..	24	..	69	..	..	1	..	..	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	69	59	128	49
2	5	3	..	..	..	..	..	..	..	16	..	94	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	94	40	134	50
..	..	..	..	1	..	..	..	..	..	9	..	142	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	142	11	153	51
..	2	..	1	..	1	..	..	..	..	7	..	36	1	..	3	..	..	2	..	..	..	..	..	1	..	1	1	..	1	4	..	..	2	36	35	71	52
1	..	..	..	..	..	..	..	..	..	3	..	80	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	80	6	86	53
..	..	..	..	..	..	..	..	..	..	2	..	..	66	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	66	3	69	54
1	..	..	1	1	..	..	..	..	..	3	..	4	31	..	1	..	..	1	..	5	..	1	1	..	..	9	..	3	..	..	..	..	..	31	48	79	55
..	1	..	..	..	..	..	..	..	..	..	..	2	32	..	4	..	..	..	..	2	..	2	..	..	..	1	..	2	..	..	..	..	2	32	22	54	56
1	..	..	3	..	..	1	..	..	..	..	..	..	..	35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35	5	40	57
..	..	2	..	..	1	..	..	..	..	1	..	4	..	..	69	..	..	..	1	..	..	..	..	..	..	..	..	1	1	..	..	..	1	69	24	93	58
1	..	5	1	..	..	..	..	..	..	2	..	5	..	..	51	..	..	5	..	..	..	..	..	..	..	..	..	..	1	..	1	..	2	51	31	82	59
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	0	150	60
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	97	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	97	3	100	61
..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	69	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	2	69	10	79	62
2	..	..	..	..	..	..	..	..	..	13	..	4	..	..	1	..	..	85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	85	23	108	63
1	1	..	..	..	..	..	..	..	..	24	..	3	..	1	4	..	..	127	1	..	..	..	..	1	..	2	..	1	..	..	1	..	..	127	51	178	64
1	..	..	..	..	..	..	..	..	..	10	..	3	..	..	1	..	1	109	..	..	..	..	..	1	..	..	..	..	..	..	5	..	..	109	27	136	65
3	1	..	..	..	..	..	..	..	..	18	..	2	1	..	..	..	1	81	..	2	..	..	..	1	..	..	1	..	..	..	..	..	..	81	47	128	66
..	6	3	1	..	..	..	..	..	..	3	..	7	..	..	3	..	..	11	..	..	1	..	..	..	..	..	..	..	..	1	1	..	2	11	40	51	67
..	..	..	..	..	..	..	..	..	..	..	..	7	..	..	2	..	..	87	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	87	15	102	68
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	..	..	53	0	53	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	..	..	..	..	..	..	..	..	..	..	..	..	..	80	0	80	70
..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	2	..	..	..	..	..	28	..	..	..	..	..	2	..	..	..	..	..	1	28	18	46	71
..	..	..	..	4	4	..	..	..	..	..	..	..	4	..	..	3	..	..	..	1	..	185	1	..	..	2	..	..	..	..	..	..	..	185	35	220	72
..	1	..	..	3	1	..	..	..	..	1	..	4	5	..	3	1	..	2	..	2	..	8	11	..	..	7	..	1	..	..	..	..	..	8	65	73	73
..	..	..	..	2	3	..	..	..	..	..	..	2	..	..	3	..	..	..	..	..	..	20	..	..	..	..	..	1	..	..	..	..	..	20	33	53	74
..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	..	98	..	..	..	..	..	1	..	..	..	1	98	6	104	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	132	..	..	..	..	..	..	..	..	..	..	132	0	132	76
..	1	..	1	2	1	..	..	..	..	1	2	1	1	1	3	5	2	..	..	1	..	..	47	..	..	..	..	..	..	..	1	..	2	47	39	86	77
..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	48	..	..	..	..	..	..	..	..	..	48	10	58	78
..	11	..	..	..	..	..	..	..	9	1	..	3	..	..	..	..	..	..	1	..	..	..	..	..	21	..	..	..	..	..	..	..	..	21	30	51	79
2	2	1	..	..	..	..	..	..	..	2	1	5	..	..	1	..	..	2	..	..	..	..	..	..	..	49	..	2	..	..	..	..	1	49	28	77	80
..	2	..	..	..	..	..	..	..	..	1	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	69	..	5	..	..	1	..	..	69	16	85	81
..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	64	..	..	..	1	..	2	64	11	75	82
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	..	..	..	..	..	40	0	40	83
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	..	..	..	..	89	1	90	84
..	..	5	6	..	1	1	..	..	..	1	..	8	..	..	8	..	..	..	..	..	1	..	..	..	..	..	3	..	48	..	4	..	1	48	57	105	85
114	215	304	163	124	143	25	102	3	22	316	19	1,066	160	45	418	130	87	587	28	103	36	229	335	63	25	161	92	67	164	17	91	4	73	5,529	2,501	8,030	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	87

students with only 4 schools taking fewer than 10% nonresident students. Three provincially owned schools each enrolled more than 10% non-residents; two of the schools (University of British Columbia and University of Manitoba) each enrolled more than 20% of the entering class from outside the province of the school.

TABLE 27.—*Ratio of First-year Students to State Populations, 1957-1958*

Number of Students per 100,000 population* in the Approved and Newly Developing Medical and Basic Science Schools of the United States	
Nevada†	1.2
Maine†	1.7
New Mexico†	2.4
Arizona	3.2
California	3.4
Missouri	3.4
Rhode Island†	3.4
West Virginia	3.4
Washington	3.5
Idaho†	3.6
North Carolina	3.6
Alabama	3.7
Texas	3.7
Montana†	3.8
Kentucky	3.8
Michigan	3.9
New Hampshire	3.9
Delaware†	4.0
Indiana	4.0
Maryland	4.0
Illinois	4.2
Wisconsin	4.3
Virginia	4.4
Massachusetts	4.5
South Carolina	4.5
Connecticut	4.6
Florida	4.6
Georgia	4.6
Ohio	4.6
Minnesota	4.9
Oregon	4.9
Louisiana	5.0
Colorado	5.1
South Dakota	5.2
Pennsylvania	5.3
Kansas	5.4
Wyoming†	5.5
Iowa	5.6
Mississippi	5.7
New Jersey	5.7
Oklahoma	5.8
Arkansas	6.1
New York	6.7
Tennessee	6.7
Vermont	6.7
North Dakota	7.0
Nebraska	7.1
District of Columbia	7.4
Utah	7.4
United States	4.7

* Estimated July 1, 1957, total population excluding members of the armed forces stationed in each area. Current Population Reports, series P-25, no. 168, Dec. 9, 1957.
† States with no medical school.

Of the total of 215 out-of-province students enrolled in the 11 Canadian schools, 40 came from the British Commonwealth of Nations and other countries, and 82 came from the United States. Thus, a total of 93 Canadians enrolled in the first medical year class of Canadian schools outside their home province. The provincial schools accounted for 49.4% of these 93 Canadians as compared to the publicly-owned schools in the United States enrolling only 14.1% of the out-of-state United States students.

TABLE 28.—*Out-of-State Enrollments of Entering Class*

	1953-1954			1957-1958		
	Number of Schools		Number of Non-residents Taken into Publicly Owned Schools	Number of Schools		Number of Non-residents Taken into Publicly Owned Schools
Percentage of Class Non resident	Privately Owned	Publicly Owned		Privately Owned	Publicly Owned	
0	0	15	0	0	7	0
<5	0	4 }23	18 }51	1	11 }25	25 }79
5-10	1	4	33	1	7	54
10-50	19	15	304	20	14	244
50-100	21	1	30	23	1	30
Totals	41	39	385	45	40	354

The Canadian provinces ranking highest as the residence of first-year medical students in 1957-1958 were Quebec and Ontario, accounting for 61.8% of the total class. However, 58.3% of the Canadian medical schools are located in those two provinces. Prince Edward Island, the only province in Canada having no medical school, was the source of the fewest medical students (7) in the entering class, although Nova Scotia was the source

TABLE 29.—*Geographic Source of Entering Students in Medical Schools of the United States from Possessions and Outlying Territories of the United States, 1957-1958*

Schools	Alaska	Canal Zone	Hawaii	Puerto Rico	Total
College of Medical Evangelists	..	..	..	1	1
Yale University School of Medicine	..	..	..	1	1
George Washington University, School of Medicine	..	..	..	1	1
Northwestern University Medical School	..	..	1	..	1
Stritch School of Medicine of Loyola University	..	..	1	..	1
University of Chicago, The School of Medicine	..	..	1	..	1
Tulane University of Louisiana School of Medicine	..	..	1	1	2
University of Maryland School of Medicine	..	..	..	3	3
Boston University School of Medicine	..	..	2	..	2
University of Michigan Medical School	..	..	1	..	1
Saint Louis University School of Medicine	..	..	1	..	1
Washington University School of Medicine	..	..	3	..	3
Creighton University School of Medicine	..	..	2	..	2
Albany Medical College of Union University	..	..	1	..	1
Cornell University Medical College	..	1	..	..	1
Western Reserve University School of Medicine	..	..	..	1	1
University of Oregon Medical School	..	..	1	..	1
Jefferson Medical College of Philadelphia	..	..	..	1	1
Temple University School of Medicine	..	..	..	5	5
Woman's Medical College of Pennsylvania	..	..	1	..	1
Baylor University College of Medicine	..	..	1	..	1
Medical College of Virginia	..	..	..	1	1
University of Washington School of Medicine	1	..	..	..	1
Marquette University School of Medicine	..	..	3	1	4
Totals	1	1	20	16	38

of only 14 students. The Yukon and Northwest Territories, the source of no entering medical students, are sparsely populated frontier areas.

ATTRITION AND GEOGRAPHIC RESIDENCE RESTRICTIONS

The hypothesis was first suggested in the 55th Annual Report[33] that the attrition of students due to poor scholarship was significantly higher in publicly-owned schools than in privately-owned schools, at least in part due to the prevalence of geographic restrictions as to residence of students, which limited the population from which publicly-owned schools drew their first-year medical students. It was then suggested that the data in future years should be examined to provide additional information on this point.

Table 31 presents a comparison of first-year enrollments, applications, and attrition with poor scholarship by type of school ownership from 1954-1955 through 1957-1958. It is apparent that in each year, the publicly-owned schools had only one-fourth to one-fifth of the number of applications as did the privately-owned schools and had only 4% to 9% of their entering students resident outside the state in which the school was located. Although the proportion of the total entering classes enrolled in each was about equal, the number of students lost by poor scholarship was significantly larger each year in the publicly-owned medical schools. The chi-square of the differences in the numbers of students actually failing or withdrawing in poor academic standing in the publicly and privately owned schools as compared to what would be expected solely on the proportion of students enrolled in each is so large for each year as to make it highly unlikely that chance alone can account for these differences. The probabilities of this are given in the bottom lines of table 31.

In a similar table last year, the significance test was inadvertently applied to the proportions of students withdrawing rather than to the numbers of students. In consequence, it did not appear then

TABLE 30.—*Geographic Source of First Year Medical Students in Medical School of Canada, 1957-1958*

	Provinces of Canada											
	Alberta	British Columbia	Manitoba	New Brunswick	Nova Scotia	Ontario	Prince Edward Island	Quebec	Saskatchewan	United States	British Commonwealth and Foreign	Totals
University of Alberta Faculty of Medicine	58	..	..	..	..	..	..	..	..	..	..	58
University of British Columbia School of Medicine	1	48	2	..	..	..	..	1	..	4	5	61
University of Manitoba Faculty of Medicine	2	1	53	..	..	3	..	..	2	2	7	70
Dalhousie University Faculty of Medicine	..	..	..	29	13	..	7	1	..	3	8	61
Queen's University Faculty of Medicine	..	..	..	1	..	53	..	3	..	4	..	61
University of Western Ontario Faculty of Medicine	..	..	..	..	..	60	..	..	..	3	..	63
University of Ottawa Faculty of Medicine	1	..	1	1	1	29	..	27	2	10	..	72
University of Toronto Faculty of Medicine	1	1	..	..	..	151	..	1	..	1	5	160
McGill University Faculty of Medicine	..	..	..	1	..	8	..	41	1	51	14	116
University of Montreal Faculty of Medicine	..	..	..	..	..	1	..	118	..	1	1	121
Laval University Faculty of Medicine	..	..	..	3	..	2	..	127	1	2	..	135
University of Saskatchewan College of Medicine	1	1	..	..	..	..	..	1	30	1	..	34
Totals	64	51	56	35	14	307	7	320	36	82	40	1,029

TABLE 31.—*First-Year Enrollments, Applications, and Attrition with Poor Scholarship by Type of School Ownership*

	1954-1955		1955-1956		1956-1957		1957-1958	
	Publicly Owned	Privately Owned	Publicly Owned	Privately Owned	Publicly Owned	Privately Owned	Publicly Owned	Privately Owned
Number of schools	39	41	39	43	40*	45*	40*	45*
Percentage of enrollment	50	50	49	51	48	52	48	52
Percentage of enrollment from out of state	9	53	5	31	4	27	4	27
Percentage of applications	26	74	19	81	27	73	27	73
Percentage of failures and withdrawals in poor academic standing	68	32	56	44	60	40	54	46
Number of students failing or withdrawing	176	81	182	142	229	139	244	204
Chi-square of differences in numbers of students actually failing or withdrawing in publicly and privately owned schools as compared to what would be expected solely on proportion of students enrolled	31.37		6.52		29.42		7.52	
p, or probability, of these differences occurring solely by chance (one degree of freedom)	<0.001 (much less than 1 in 1,000)		Between 0.01 to 0.02 (about 1 in 90)		<0.001 (much less than 1 in 1,000)		>0.005 (almost 1 in 200)	

* Includes the three newly developing schools that are provisionally approved.

that the differences were as highly significant each year as they actually are. When the chi-square test is applied to the differences in numbers of students lost by poor scholarship in publicly owned versus privately owned schools, the probability of this happening by chance alone is not more than 1 in 90 and for two of the years is far less than 1 in 1000.

Another way of stating the problem is that their geographical restrictions on residence restrict application by and hence choice of as many highly capable students on the part of publicly-owned medical schools as by the more generally nonrestrictive privately owned schools. According to a study currently in progress by Dr. Helen Gee, of the Association of American Medical Colleges,[34] there is evidence that the Medical College Admissions Test scores are lower on the average for entering students in the publicly owned schools than for entering students in the privately owned schools. That test is taken by practically all applicants to United States medical schools. Such a difference in average scores of the two groups of students supports by different data the thesis suggested by the attrition from poor scholarship. It should be noted that, as in the case with all averages, the average scores of entering students in some publicly-owned schools are higher than are the average scores in some privately-owned schools. The important factor from both sets of data is not type of ownership but rather the presence or absence of any policy likely to restrict or discourage enough applications from among which the best classes of students can be selected.

TABLE 32.—*Comparative Analysis of College Records of First-Year Medical Students*

College Grade Average, First-year Medical Students		United States								Canada
		1950-1951	1951-1952	1952-1953	1953-1954	1954-1955	1955-1956	1956-1957	1957-1958	1957-1959
3.6-4.0	(A)	40	30	18.0	21.1	16.8	15.8	16.1	17.7	17.9
2.6-3.5	(B)	43	55	67.5	68.9	69.0	70.6	69.9	66.0	46.8
1.0-2.5	(C)	17	15	14.6	10.0	14.2	13.6	14.0	16.3	35.3

The policy of restricting most admissions to students who live in the state where the school is located has been evident for years in many of the publicly owned medical schools. Such a policy is advocated and defended by legislators as insuring educational opportunities for the sons and daughters of the taxpayers of the state, who support those schools.

The very policy and practice of so selecting entering classes that only a small proportion of students come from other states tends to preselect applicants to the disadvantage of the school and of society itself. Intelligence, high motivation, and other attributes desired by society and necessary in medical students are not distributed geographically. Capable students are discouraged from applying to a medical school across state lines if they are unlikely to be accepted because of where they happen to live. In consequence, some 12 privately-owned medical schools without restrictions on place of residence had 14 or more applicants per place in the entering class in 1957-1958 and an additional 7 privately owned schools had 12 to 14 applicants per place. Of the 18 medical schools having 9 to 12 applicants per place, 15 or five-sixths are privately owned. On the other hand, of the 16 medical schools that had only two to three applicants to each place in the entering class, all but one were publicly owned. Two of the three medical schools which had fewer than two applicants per place in 1957-1958 are state universities.

With their choice of an adequate applicant population from which to select limited by restrictions on residence together with pressures to fill their classes, many publicly-owned medical schools accept as students some individuals who are not as capable as might be some others who could have been accepted otherwise. This results in dual tragedy. The more apparent one is the failure of those students. The more important casualties, however, are the school and state itself for not having taken or had the opportunity to enroll the more capable students who did not apply or who were rejected solely because of state of residence. Some of those students may also have been lost to medicine itself.

Parochialism to this degree that is so disadvantageous both to capable individuals and to the broader interests and welfare of society itself should not be tolerated. It is to be hoped that state legislators and other public officials concerned with these matters will cooperate with university and medical school administrators in bringing the policies restricting admissions into a more realistic and socially useful focus.

COLLEGE RECORD OF FIRST-YEAR MEDICAL CLASS

Table 32 presents a comparative analysis of the premedical collegiate scholastic record of the entering classes in medicine in the United States each year since 1950-1951. As has been true since 1951-1952, about two-thirds of the first year medical classes had college grade averages of "B", while about one-fifth to one-sixth had college grade averages of "A" on entering medical school. Since 1954-1955, the proportion of students entering medical school with college grade averages of "A" and of "C" have been approximately equal, together comprising about one-third of the total entering classes.

In 1957-1958, 22 schools had more than the average proportion (17.7%) of "A" students in their entering classes, ranging from 19.6% to 68%. Nine of these were publicly-owned and 13 privately-owned schools. Seven of the 22 schools had entering classes in which students with "A" college records comprised more than 50% of the class. On the other extreme, 32 schools had more than the average proportion of "C" students (16.3%), ranging from 17.5% to 70.5% of students entering with "C" college records. Nineteen schools reported that one-fourth or more of the students in their entering classes had "C" college grade averages. Two of these are the same schools that also reported a significantly higher than average proportion of "A" students in their entering classes.

TABLE 33.—*Premedical Education of First-Year Students in the United States, 1957-1958*

	Size of First-Year Class	Less than Three Years of College		Four Years of College	Degree	Advanced Degree	% with Degrees
Medical College of Alabama	81	..	13	68	62	..	76.5
University of Arkansas	93	..	34	59	44	3	47.3
College of Medical Evangelists	112	..	..	112	111	..	99.1
University of California, Los Angeles	49	..	7	42	41	1	83.7
University of Southern California	67	..	19	48	39	8	58.2
Stanford University	62	..	16	46	44	2	71.0
University of California, San Francisco	79	4	32	43	35	1	44.3
University of Colorado	85	..	23	62	48	2	56.5
Yale University	79	..	9	70	66	1	83.5
Georgetown University	108	2	4	102	102	2	94.4
George Washington University	101	..	35	66	63	..	62.4
Howard University	103	..	1	102	100	9	97.1
University of Florida	51	..	1	50	48	2	94.1
University of Miami	79	..	25	54	42	2	53.2
Emory University	74	..	15	59	54	2	73.0
Medical College of Georgia	103	..	19	84	74	3	71.8
Chicago Medical School	73	..	..	73	72	1	98.6
Northwestern University	130	..	31	99	93	1	71.5
Stritch School of Medicine of Loyola University	88	..	26	62	57	2	64.8
University of Chicago	72	2	5	65	57	4	79.2
University of Illinois	190	..	94	96	84	5	44.2
Indiana University	158	..	67	91	66	4	41.8
State University of Iowa	120	..	72	48	42	5	35.0
University of Kansas	102	..	..	102	89	1	87.3
University of Louisville	103	..	7	96	94	4	91.3
Louisiana State University	125	..	59	66	49	2	39.2
Tulane University	134	..	61	73	58	1	43.3
Johns Hopkins University	74	..	..	74	74	2	100.0
University of Maryland	93	1	8	84	80	9	86.0
Boston University	74	..	4	70	68	5	91.9
Harvard Medical School	114	..	2	112	109	1	95.6
Tufts University	114	..	..	114	112	4	98.2
University of Michigan	206	1	131	74	69	4	33.5
Wayne State University	75	..	49	26	25	2	33.3
University of Minnesota	131	..	47	84	65	4	49.6
University of Mississippi	80	..	28	52	40	1	50.0
University of Missouri	75	..	18	57	53	4	70.7
St. Louis University	121	..	19	102	87	1	71.9
Washington University	86	..	17	69	67	..	77.9
Creighton University	77	..	24	53	47	3	61.0
University of Nebraska	87	..	42	45	29	3	33.3
Dartmouth Medical School	24	..	15	9	8	1	33.3
Seton Hall College of Medicine	80	..	3	77	76	5	95.0
Albany Medical College of Union University	63	1	..	62	61	1	96.8
University of Buffalo	84	..	14	70	68	6	81.0
Columbia University	120	..	..	120	120	4	100.0
Cornell University	84	..	3	81	80	1	95.2
Albert Einstein College of Medicine of Yeshiva University	98	..	2	96	95	6	96.9
New York Medical College	128	..	..	128	126	8	98.4
New York University	134	..	3	131	127	6	94.8
State University of New York, Downstate Medical Center, New York City	153	..	6	147	145	3	94.8
University of Rochester	71	..	8	63	59	0	83.1
State University of New York, Upstate Medical Center, Syracuse	86	..	12	74	71	6	82.6
University of North Carolina	69	..	13	56	48	4	69.6
Duke University	79	..	18	61	54	..	68.4
Bowman Gray School of Medicine of Wake Forest College	54	..	1	53	48	3	88.9
University of North Dakota	40	..	19	21	18	2	45.0
University of Cincinnati	93	..	4	89	87	6	93.5
Western Reserve University	82	..	..	82	78	3	95.1
Ohio State University	150	..	5	145	136	4	90.7
University of Oklahoma	100	..	39	61	43	4	43.0
University of Oregon	79	..	28	51	31	2	39.2
Hahnemann Medical College	108	..	2	106	104	9	96.3
Jefferson Medical College	178	..	5	173	170	5	95.5
Temple University	136	..	6	130	127	3	93.4
University of Pennsylvania	128	..	1	127	125	2	97.7
Woman's Medical College of Pennsylvania	51	..	2	49	46	5	90.2
University of Pittsburgh	102	..	3	99	95	6	93.1
University of Puerto Rico	53	..	4	49	37	..	69.8
Medical College of South Carolina	80	..	9	71	64	..	80.0
University of South Dakota School of Medicine	46	..	12	34	33	1	71.7
University of Tennessee	220	..	135	85	77	3	35.0
Meharry Medical College	73	1	8	64	51	6	69.9
Vanderbilt University	53	..	19	34	29	1	54.7
University of Texas Southwestern Medical School	104	..	32	72	59	7	56.7
University of Texas Medical Branch	132	..	29	103	73	8	55.3
Baylor University	86	..	18	68	65	1	75.6
University of Utah	58	1	25	32	22	5	37.9
University of Vermont	51	..	..	51	44	2	86.3
University of Virginia	77	..	4	73	69	4	89.6
Medical College of Virginia	85	..	7	78	75	3	88.2
University of Washington	75	..	17	58	46	1	61.3
West Virginia University	40	..	..	40	33	1	82.5
University of Wisconsin	90	..	57	33	28	2	31.1
Marquette University	105	..	4	101	80	14	76.2
Totals	8,030	13	1,656	6,361	5,790	281	72.1

Although medical school admissions committees recognize the differences among colleges in the relationship of a given grade average to scholastic achievements, this should be pointed out to others who might consult table 32. For instance, scholastic achievement in one college that is awarded a "B" grade might in another college be given a "C" grade and similarly, though to a lesser degree, in the case of "A" compared to "B" grades. The scholastic record in college is one factor among many that are considered in the selection of medical students by the medical school faculties.

Table 32 also presents the premedical college grade averages of the 1957-1958 Canadian first year medical classes. The proportion of students having "A" college grades was similar to that in the United

States schools. In Canada, however, there was an average for all 12 schools of twice the proportion of students having "C" college records and hence one-third fewer students with "B" college records than in United States schools. Whereas in the latter only one-sixth of the entering medical classes had "C" college grade averages, in Canada more than one-third of the entering students had a college grade average of "C". Six of the 12 Canadian schools did have a higher than average (17.9%) proportion of "A" students in their first year medical classes, with one provincial school having 65% of its students entering with an "A" college grade average. Six Canadian schools had a larger than the over-all Canadian average of "C" students. In fact, three of the schools had more than 45% of their medical students entering with "C" college grade averages. Only two schools had fewer "C" students than the United States over-all average of 16.3% and these schools also had a significantly higher proportion of first year medical students with "A" grade averages in college.

TABLE 34.—*Comparison of Previous Years and the Current Year of Number and Proportion of Medical Schools Having Entering Classes Consisting Predominantly of Students with College Degrees*

	1954-1955		1955-1956		1957-1958	
Entering Students with Degrees, %	Schools of 81, No.	%	Schools of 85, No.	%	Schools of 85, No.	%
100	4	4.9	6	7.0	2	2.3
95.1-99.9	11	13.5	14	16.4	13	15.3
90.1-95	7	8.6	6	7.0	12	14.1
Total	22	27.0	26	30.4	27	31.7

Although no comparative data have been assembled, it is possible that Canadian college grades are significantly lower than are grades in United States colleges for similar academic achievement.

PREPROFESSIONAL ATTAINMENTS OF THE ENTERING CLASS

In 1957-1958, 79.2% of the entering class had four years of college and 72.1% had a degree on entering medical school. Those having only three years of college (85 semester hours or more) comprised 20.6% of the entering class. In 1956-1957, 77.5% of the entering class had four years of college, 73% had college degrees, and 22.5% entered medical school after three years of college. Table 33 presents the preprofessional attainments of the 1957-1958 entering medical class.

It thus appears that more students have a longer education before entering medical school than was the case in 1956-1957. Because this appeared to be a trend, a table was begun last year comparing the proportion of medical schools having entering classes made up predominantly of students holding college degrees. Table 34 brings that table to date, with the addition of numbers of schools in each category. It appears that a significant trend is occurring of more schools as well as a greater proportion of schools each year having entering classes consisting of more than 90% of students with degrees. Although four fewer schools in 1957-1958 had classes entirely composed of students with degrees, twice as many schools (six more) had first-year classes in which more than 90% of the students had degrees. This, coupled with a corresponding rise in the proportion of students having four years of college prior to entering medical school and a matching decrease in the proportion who have had only three years of college preparation, demonstrates a trend toward a greater college preparation before entering medical school.

The foregoing applies to the actual attainments of the entering class. Presumably influencing this are the minimum requirements for applicants as submitted to the Association of American Medical Colleges by the medical schools for publication each year in their guidebook.[35] Table 35 compares these requirements for the preceding two years, the current year, and for next year as most recently published. It is apparent that each year more schools require four years of college or a degree as their minimum stipulated to applicants. Although the 1957-1958 year appears to arrest this trend, the requirements published in the 1958-1959 guidebook for applicants to the September 1959 classes again shows an increase in the number of schools requiring four years of college or a degree.

The admission requirements of Canadian medical schools are obscured for those unfamiliar with the Canadian pattern of education in which the high schools have a grade 13 called senior matriculation, approximately equivalent to a first college year, as well as by three Canadian medical schools (Queen's, Ottawa, and Toronto) having the two premedical college years as a responsibility of the faculties of medicine. Taking these facts into consideration, table 13 shows that 10 of the Canadian schools require as a minimum the equivalent of three years of college before entering the basic four-year medical program, and the other two schools (Montreal and Laval) require a college

TABLE 35.—*Comparison of Admission Requirements, 1954-1955 with 1957-1958*

Stated Admission Requirement*	1954-1955	1956-1957	1957-1958	1958-1959
Less than three years college	1	1	1	1
Three years college	71	73	74	72
Four years college	8 }9	4 }11	8 }10	10 }12
Degree	1	7	2	2
Totals	81	85	85	85

* Each column taken from book "Admission Requirements of American Medical Colleges" (Including Canada), Association of American Medical Colleges, for the year stipulated. However, each column actually applies to next entering class. For example, the school's requirements in the column headed 1957-1958 were submitted by the schools to the Association of American Medical Colleges in the spring of 1957 for publication for guidance of applicants in the autumn of 1957 for the class of 1958-1959.

degree. Information on the preprofessional attainments of Canadian first-year medical students was not available in time for presentation in this report.

MEDICAL STUDENTS ADMITTED TO ADVANCED STANDING

A total of 271 students were admitted to advanced standing in United States medical schools in 1957-1958, 67 into second-year classes, 202 into third-year classes, and 2 into the fourth-year. All but 45 students, who came from foreign schools, transferred from approved medical schools in the United States and Canada. About one-half of the 226 students transferring from approved medical schools were accounted for by students from the four schools of the basic medical sciences.

The 115 students from schools of the basic medical sciences transferred to advanced standing into the third year (with one exception) of 25 United States medical schools and one Canadian school. Those six schools taking about two-thirds (65%) of these transfer students in 1957-1958 were Harvard (22), Medical College of Virginia (17), University of Kansas (13), Northwestern (9), University of Pennsylvania (8), and Southwestern (6).

In the 1957-1958 academic year, 27 medical schools in the United States admitted 45 students to advanced standing from other than approved medical schools in the United States and Canada, with 25 admitted to second-year classes, 18 to the third-year, and one to the fourth-year. Students from medical schools in four countries (Hungary, Switzerland, Netherlands, and Cuba) accounted for 33 or about 73% of the 45 students. Hungarian medical schools alone contributed 12 students, or 26.6% of the total. The remaining 12 students came from schools in eight countries in addition to the foregoing (Germany, Sweden, Italy, Czechoslovakia, Lebanon, Mexico, Poland, and England).

A total of 29 students were admitted to advanced standing in Canadian medical schools in 1957-1958, 10 into second-year classes, 18 into the third-year, and 1 into the fourth-year. Of the 29, 18 students or 62% came from foreign medical schools and 4 transferred from United States schools.

Seven of the Canadian medical schools admitted 18 students to advanced standing from nine foreign medical schools. Of these 18, 11 students or 61% came from Hungarian medical schools. The remaining seven students came from seven schools in six other countries (Switzerland, Scotland, Poland, Netherlands, Ireland, and Germany). The three Canadian schools having two premedical years under the administration of the Faculty of Medicine (Ottawa, Queen's, and Toronto) were excluded in the above analysis insofar as the second year was concerned because of the certainty in the case of three students in one school and the possibility with seven other students admitted to advanced standing in the second year that the premedical or college years were intended rather than the second medical year.

TABLE 36.—*Part-Time or Special Students*

	Study or Research						Because of Academic Difficulty	Certain Required Course, Work Elsewhere	Job for Financial Reasons	Other	Totals by Year
	For Degree			Teaching While M. D. Student and Holding Degree							
	M.A. or M.S.	Ph.D.	Nondegree	Bachelors	Masters	Ph.D.					
1st year	1	1	5	0	4	6	42	3	0	8*	70
2nd year	19	8	11	3	1	8	11	2	1	7†	71
3rd year	17	1	2	2	1	7	16	0	0	3‡	49
4th year	8	0	2	1	0	8	9	0	0	5§	33
Totals by reason	45	10	23	6	6	29	78	5	1	23	226
		78			41						

*Foreign doctor 1
Special student program (Univ. Vermont) 4
Illness 1
Poliomyelitis 1
Dentist 1
8

†Teaching assistants 2
Poliomyelitis 1
Student research fellowship or assistant 2
Marital difficulty 1
Foreign student 1
7

‡Illness 2
No explanation 1
3

§Experiment in medical education (Univ. Buffalo) 1
Flight training 3
No explanation 1
5

PART-TIME OR SPECIAL STUDENTS

Included in this group are those students who undertook in the 1957-1958 academic year a part-time course of study which will be given credit for the M.D. degree. Not included are those students who withdrew from all courses which would be given credit for the M.D. degree for the purpose of pursuing advanced study. The latter students will be discussed in the next section of this report.

There were a total of 226 part-time or special students in 47 United States medical schools in the 1957-1958 academic year. This was 0.76% of all 29,473 medical students. In order to determine the reasons for these students being in a part-time or special course of study, the medical schools this year were requested to enumerate such students by class in the 10 categories heading table 36. Almost 62% of all the part-time or special students are in their first two years. In fact, one-third are in their first year. It is gratifying to note that only one student was part time solely because of the necessity of earning money in outside employment.

One of the two largest over-all causes for students being part time or special (34%) was academic difficulty (in 18 schools), particularly in the first year (54% of those in this category). This would be expected, as the largest attrition has for years been in the first year of medical school. If one counts the number of students who withdrew because of academic failure or difficulty with those who were part time on this account to obtain a proportion of the total first-year class of 8,030 having serious academic difficulty, it appears that this amounts to 483 students, or 6% of the total first-year class.

TABLE 37.—*Attrition in the Approved* Medical Schools in the United States, 1957-1958*

Year	Enrollment	Failed	Withdrew, Poor Standing	Withdrew, Good Standing	Totals	Enrollment Lost, %
First Year	8,030	350	98	181	629	7.8
Second Year	7,504	153	19	65	237	3.2
Third Year	7,051	50	5	38	93	1.3
Fourth Year	6,888	8	1	13	22	0.3
Totals	29,473	561	123	297	981	

*Includes the three newly developing provisionally approved schools.

Exactly equaling academic difficulty as the cause for part-time or special study is the number of students undertaking advanced study, either for a degree or unrelated to an M.S. or Ph.D. Those 78 students in 18 schools comprise 34.5% of the 226 part time or special students. More than three-fourths of these 78 students were in their second (52.5%) and third (25.6%) years. It should be noted that these figures do not purport to show and should not be interpreted to mean that only 78 of 8,030 medical students undertake advanced study. It simply accounts for one reason for medical students being in special or part-time programs.

In the next largest category are those medical students who are also teaching, usually in a basic medical science in which they have had advanced study. More than 85% of those 41 medical students in 21 schools hold advanced degrees, with about 70% of them Ph.D. degrees and 15% M.S. or M.A. degrees.

Except for five students in the first two years who had had certain required course work elsewhere, the remaining 23 special or part time students are accounted for as stipulated in the footnote to table 36. Particular experiments in medical education by two schools (University of Buffalo and University of Vermont) engage five students, and illness or its effects was the problem with five students. The other 13 students were in part-time or special study for a variety of reasons.

There were only two part-time or special medical students, both men, in Canada. Each was in the second medical year of the University of Saskatchewan. One was teaching as a Ph.D.; the other had had previous academic difficulty.

STUDENTS WITHDRAWING FOR ADVANCED STUDY

Not included in the total of 29,473 medical students in 1957-1958 were 97 students who entirely withdrew in 43 United States schools from all M.D. credit courses to pursue advanced study. All but one of these 97 students withdrew during their first three years of medical school; 84.5% were in their second and third years. The advanced study was toward a graduate degree (M.S. or Ph.D.) other than the M.D. by 47 students (48%), though not degree related in the case of the other 50 students. At least 78 students (80%) of the 97 were pursuing study in the traditional basic medical science disciplines; in addition, one student's field was "biological sciences" and another student's field was given as "nuclear science." Only three students had withdrawn for study in a clearly clinical field (psychiatry). It is not possible to categorize accurately the field of study of 14 of the 97 students because the field as given was "USPHS Fellowship" or "medicine" or "surgery", for example. Considering that 10 of the 14 students withdrew during their second year, it is probable that their fields of advanced study were essentially basic science rather than clinical.

As noted in the section on part-time and special students, neither those students doing advanced study nor students withdrawing from M.D. credit work, nor both together, represent the number of medical students pursuing advanced study, nor the number of schools whose educational programs are sufficiently stimulating to the spirit of scientific inquiry in medical students. The request this year to medical schools for information was not designed to elicit such information but rather to account more fully than previously the reasons for students withdrawing for advanced study and for their being in part time or special M.D. credit programs. It should be recognized that other medical students, perhaps many other students, are pursuing advanced study and research during their unscheduled periods while they are full time medical students.

TABLE 38.—*Comparison of Attrition First-Year Medical Students*

Year	Total First-Year Class	Students Leaving		Students Failing*		Students Leaving, Other Reasons†	
		No.	% of Class	No.	% of Class	No.	% of Class
1954-1955	7,576	418	5.5	257	3.39	161	2.12
1955-1956	7,742	480	6.2	324	4.18	156	2.01
1956-1957	8,014	544	6.8	368	4.59	176	2.19
1957-1958	8,030	629	7.8	448	5.57	181	2.25

*Failed or withdrew in poor academic standing.
†Withdrew in good academic standing for all other reasons.

In each of three Canadian medical schools, one student withdrew from all M.D. credit work in 1957-1958 to pursue advanced study. Each of the three students favored a different field, although all were studying in one of the traditional basic medical science disciplines. Two of the three were in their first medical year; the other withdrew from the second medical year. Two of the three students were in nondegree related advanced study.

ATTRITION OF MEDICAL STUDENTS

Table 37 presents attrition by class and cause of students lost to medicine in 1957-1958 in United States schools. It was hoped that after receiving responses from the medical schools to identical questions regarding student attrition each year for four successive years, the attrition in a single class of students throughout their four years could be obtained on a national basis. Such did not prove to be the case. It appears that this can be done only on the basis of individual student records rather than on the numerical totals reported.

There has been in 1957-1958 an increase in the number and proportion of students lost because of academic difficulty in the first three years and a decrease in the number and proportion lost for this cause in the fourth year, as compared with previous reports. However, the number of students withdrawing for any cause in the fourth year is too small to warrant conclusions in regard to trends as to cause. With the exception of the 1956-1957 year, when an unusual number and proportion of fourth-year students withdrew in poor academic standing, there has been no significant change for fourth-year classes since 1954-1955, when this information was first regularly compiled.

In 1957-1958, as in the previous three years, about two-thirds of all student losses were in the first-year class. The current data show that 71% of these losses were due to failure or withdrawal in poor academic standing, as compared to 67.6% in the previous two years. The second-year class in 1957-1958 had 72.5% of its losses from this cause, as compared to 64% in 1956-1957 and 62% in 1955-1956. In the current third-year and fourth-year classes, 55.6% of the students lost, failed, or withdrew in poor academic standing, compared to 67% in 1956-1957 and 55% in 1955-1956.

TABLE 39.—*Attrition in the Approved Medical Schools in Canada, 1957-1958*

Year	Enrollment	Failed	Withdrew, Poor Standing	Withdrew, Good Standing	Totals	Enrollment Lost, %
First	1,011	49	2	34	85	8.4
Second	916	35	0	9	44	4.8
Third	928	9	0	6	15	1.6
Fourth	830	1	0	4	5	0.6
Totals	3,685	94	2	53	149	...

Examination of attrition data for the current year and for the past three years shows an increasing number and proportion of students in both first-year and second-year classes withdrawing from medical school. A comparison for the first-year classes is presented in table 38, although a table showing entirely similar trends could be presented also for second-year classes since 1954-1955. It is apparent that the increase in attrition is entirely occasioned by an increasing number and proportion of students failing and withdrawing in poor academic standing. The reason for this is not evident from the data available at this time. That it is not due to earlier identification of poor students is apparent, because if that were a major factor, one would expect a decline of attrition from this cause in second-year and/or third-year classes. Such is not the case. Rather, they have shown similar trends of rising numbers and proportions of students failing and withdrawing in academic difficulty since 1954-1955 to the present. On the other hand, the number and proportion of students withdrawing for all other reasons has shown no significant change for first-year to fourth-year classes since 1954-1955. It has been, in proportion of the total class sizes each year, from 0.6 to 1.0% for second-year classes, about 0.5% for third-year classes, and about 0.21% for fourth-year classes.

TABLE 40.—*Estimates of Median Student Expenses per Year**

Item	Privately Owned Schools (N=45)	Publicly Owned Schools (N=40) Resident	Publicly Owned Schools (N=40) Nonresident
Tuition and fees	$1,002	$500	$836†
Room and board (minimum)	806	765	765
Books and supplies (not including microscopes)	150	130	130

*Reprinted with slight modification from "Admission Requirements of American Medical Colleges (including Canada), 1958-1959" published by the Association of American Medical Colleges, Chicago.

†Excluding one school that accepts no nonresidents in the first-year class; no nonresidents are accepted at six schools.

Table 39 presents by class and cause the attrition of students in the 12 Canadian medical schools for 1957-1958. Comparable data was not presented in previous years. Of the total students lost to medicine for all causes in all classes, 57% occurred in the first-year class and 86.6% in the first two years. Two-thirds of these were due to failure or withdrawal in poor academic standing. This is comparable with, although not exactly the same as, the experience in United States schools. Although, as in the case with United States schools, Canadian medical schools have half of their students lost to medicine in the third and fourth years withdrawing in good standing, both the numbers (10) and proportion (0.56%) of the total classes are small for such attrition.

STUDENT EXPENSES

Table 40 shows the most recent annual expense estimates for medical students at United States medical schools, based on information secured by the Association of American Medical Colleges. As that association pointed out,[36] the figures can be regarded as only rough budget goals. They are subject to change even within the next year, and there is a considerable range within each of the categories in the table. With tuition and fees, for example, the range is $592 to $1,280 for privately owned schools, $120 to $900 for residents in publicly owned schools, and $416 to $1,300 for nonresidents in publicly owned schools. Tuition in the individual schools is given in table 12 for United States schools and in table 13 for Canadian schools.

TABLE 41.—*Canadian Tuition Fees*

	Publicly Owned (N=7)		Privately Owned (N=5)	
	Resident	Nonresident	Resident	Nonresident
Average 1st Year..........	$506.68	$535.25	$578.80	$655.80
Average 2nd Year..........	529.54	558.11	Same	Same
Average 3rd Year..........	536.68	565.25	Same	Same
Average 4th Year..........	558.11	566.25	Same	Same
Over-all average..........	527.75	566.32	578.80	655.80
Over-all median..........	531.00	531.00	545.00	630.00

It should be emphasized that the living expenses of individual students vary greatly, depending upon their family responsibilities and upon their spending habits.

Table 41 presents by medical school year the average tuition charges in the Canadian medical schools as well as over-all average tuition and over-all median tuition. In order to present meaningful figures, it is necessary to present the averages in the publicly owned schools by year because in three schools (Alberta, Toronto, and Saskatchewan) different tuition fees are charged in the four years of the medical school. Similarly, the over-all averages and medians were obtained by treating each of the four years in each of the 12 schools as a separate tuition figure. This was not necessary in the case of the privately owned schools, which uniformly charge the same fee in each of the four years. The designation private ownership has as much or as little meaning relative to sources of financial support for at least two of the five Canadian schools so categorized as does ownership versus sources of support in many United States schools classified as privately owned.

Table 13 presents tuition charges by individual school. It will be noted that the ranges in tuition are not as broad in Canadian schools as compared to United States schools. Tuition in the publicly owned schools is comparable in the two countries. The lower tuition in the privately owned schools is significant, even allowing for differences in dollar value and purchasing power in the two countries. The range in Canadian publicly owned schools is $391 to $585 for residents, and $391 to $731 for nonresidents. The spread for privately owned schools is $520 to $750 for residents and $520 to $834 for nonresidents.

Estimates of other student expenses, such as for room and board, books, and supplies were not available regarding Canadian students in time for publication in this report.

SCHOLARSHIP AND LOAN FUNDS, 1957-1958

In the questionnaire which largely serves as a basis for this report, information was sought pertaining to the usage of scholarship and loan funds. A large body of data, probably more detailed and complete than has been recently available in regard to usage of these funds, was collected, and pertinent aspects of these data are presented here. Although this material is believed to be nearly complete as it concerns scholarship and loan funds administered in some manner by the medical schools, there is such a variety of sources of funds, particularly for loans, that this study should not be considered as encompassing all scholarship and loan funds utilized by medical students during the 1957-1958 academic year.

The data presented in this section of the report excludes the medical schools still in development. Table 42 depicts some major characteristics of scholarship usage. Because of apparent gross differences in United States schools by the type of ownership, data are presented according to this division as well as for United States schools as a whole.

Although enrollment is almost evenly divided between publicly and privately owned United States schools (approximately 14,000 and 15,000), of the nearly one and a half million dollars expended for scholarships in 1957-1958, only 25% was utilized in publicly owned schools as opposed to 75% in privately owned institutions. This ratio is necessarily reflected in the amount of expended scholarship money artificially distributed over the total student enrollment. In addition, the average dollar value of scholarships, the number of scholarships granted, and the percentage of the total enrollment holding scholarships are all significantly greater in the privately owned schools.

TABLE 42.—*Utilization of Scholarship Funds, 1957-1958 (82 United States and 12 Canadian Schools)*

	United States Schools		All United States Schools	Canadian Schools
	Public (39)	Private (43)		
Scholarship funds expended.....	$358,638.00	$1,099,229.00	$1,457,867.00	$166,432.00
Scholarship funds expended per students enrolled....	$26.64	$72.78	$50.30	$45.16
Average dollar value per scholarship......	$391.10	$568.67	$511.53	$196.73
Average tuition charge.......	$487.87	$993.02	$752.75	$540.94
Number of scholarships granted	917	1,933	2,850	846
Percent of enrollment holding scholarships	6.5	12.8	9.9	23.0

On initial thought it might be presumed that the considerably larger scholarship sums distributed over a greater proportion of the student body would render private schools a distinct financial advantage to medical students. However, this advantage is partly offset by higher tuition charge. As indicated in table 42, the average tuition charge for private schools is more than $500 greater than the average for public schools. Of the total tuition charge of

$21,800,000 for the academic year 1957-1958 for all students in United States medical schools, 15 million dollars was assessed by privately owned schools and $6,800,000 by publicly owned schools. Scholarships awarded by private schools reduced tuition charge paid by students to $13,900,000. In public schools, scholarship awards reduced student tuition payments to $6,400,000. The over-all tuition charge borne by students was reduced by scholarship awards for $21,800,000 to $20,300.000.

In an effort to create what might be called an index of scholarship granting performance, United States medical schools according to type of ownership were arrayed in rank order by expended scholarship dollars distributed over the total student enrollment. In effect, the school of the highest order in this array expended in 1957-1958 most scholarship dollars per student enrolled. It is to be emphasized that these data are presented without specific knowledge of the degree to which real student needs were met and must be considered as representing an impersonal relationship between scholarship dollars expended and the number of students enrolled.

Table 43 summarizes this array of scholarship awards "Performance." Although schools are not identified by name, any institution desiring to know where it stands in the rank order can obtain this information by writing to the Council on Medical Education and Hospitals. In table 43, the dollars expended for scholarships divided by the number of students enrolled are presented for the upper, middle, and lower five schools in the rank order. The figure for the median school and the range is presented for each group of five schools. The public school of the highest order ($680.45 for scholarships per student enrolled) in this table is an exception that deserves explanation. A legislative appropriation made it possible to extend scholarships with an average value of approximately $1000 to almost two-thirds of the student body and the total scholarship expenditure, if spread over the entire enrollment, would have provided each student with funds more than $100 in excess of tuition costs. This same institution reports no funds available for loan purposes.

Table 43.—*Scholarships Awards "Performance"*
(Dollars Expended per Student Enrolled)

	Public (39)		Private (43)	
Schools	Median	(Range)	Median	(Range)
Upper Five	$122.76	($680.45-76.55)	$213.15	($260.69-203.85)
Middle Five	11.60	(15.95- 9.66)	27.46	(33.86- 24.57)
Lower Five	0	(1.09- 0)	0	(1.91- 0)

In both the publicly and privately owned categories of schools, there are three institutions which by policy grant no scholarships. These six institutions acount for the apparently aberrant figures for the lower five schools.

Forty-four schools reported that all available scholarship funds had been expended and 41 of these same institutions indicate that they could justify the expenditure of considerably greater funds.

Thirty-two schools reported scholarship funds available totaling almost $400,000 that were not utilized. In 24 instances it was indicated that the nonutilization was the result of restrictions imposed by the donor, university policy, or by the committee responsible for administering the funds. Of the 32 schools with unused scholarship funds, 24 state that they could justify the expenditure of additional funds if less restrictive policies governed their use.

Table 44.—*Utilization of Loan Funds, 1957-1958*
(82 United States and 12 Canadian Schools)

	United States Schools		All United States Schools	Canadian Schools
	Public (39)	Private (43)		
Loan funds expended.....	$617,235.00	$680,338.00	$1,292,573.00	$176,614.00
Loan funds expended per student enrolled.....	44.49	45.04	44.77	47.93
Average dollar value per loan.................	354.73	471.47	407.66	238.67
Number of loans granted	1,740	1,443	3,183	740
Per cent of enrollment granted, loans..........	12.5	9.6	10.7	20.1

Fifty schools indicated that first-year students are eligible for scholarship assistance, and in 27 instances eligibility can be established only after completion of the first year.

Gross characteristics of the utilization of scholarship funds by Canadian medical schools are presented in table 42. The major difference between scholarship fund utilization in Canada and the United States is that their funds are spread over a larger portion of the student enrollment. Scholarship dollars expended amounted to 8.3% of the total Canadian tuition charge (in the United States this was 7.0%).

Eleven of the 12 Canadian schools grant scholarships. Two schools reported unexpended scholarship funds of approximately $2,000, and another did not specify the amount unexpended. Seven schools indicated that additional funds for scholarships could be justified.

Eight schools may award scholarships to students at the beginning or in the course of the first year of medical study, and in two schools students are eligible for scholarships only after completing the first year.

Certain gross characteristics of utilization of loan funds are presented in table 44. The significant differences between publicly owned and privately owned medical schools noted in utilization of scholarship funds are not apparent in loan fund utilization. The major difference is that private schools granted loans of greater dollar value to a somewhat smaller percentage of enrolled students.

As was done for scholarship funds, United States medical schools according to type of ownership were arrayed in rank order by expended loan fund dollars distributed over the total student enrollment. Again it is to be emphasized that these data must be considered as representing only an impersonal relationship between loan funds expended and the number of students enrolled during 1957-1958, since this material is presented without specific knowledge of the degree to which real student loan needs were met.

Table 45.—*Loan Granting "Performance" (Dollars Expended per Student Enrolled)*

Schools	Public (39) Median	Public (39) (Range)	Private (43) Median	Private (43) (Range)
Upper five	$115.34	($790.96-73.74)	$126.76	($384.75-108.97)
Middle five	36.21	(38.23-34.60)	29.91	(34.78- 29.18)
Lower five	10.28	(11.94-0)	7.32	(7.99- 1.17)

Table 45 summarized this data; the dollars expended for loans divided by the number of students enrolled are presented for the upper, middle, and lower five schools in the rank order. The figure for the median school and the range is presented for each group of five schools.

The public school of the highest rank order ($790.96 for loans per student enrolled) in table 45 is a two-year institution whose graduates must transfer to medical schools in other states to complete the last two years of medical school study. A few years ago, the state legislature authorized loans up to $2,000 per student per year not to exceed $75,000 in total loans a year for graduates of the granting school while they complete their last two years of study elsewhere. Grantees must be residents of the granting state and must agree to return to that state to practice. Slightly greater sums may be loaned to students who agree to practice in specified small communities in the state; in addition, for each year practiced in such a community, the borrower is forgiven for one-fifth of the loan and interest.

All but one school in the United States and one in Canada granted loans during 1957-1958. Of the 81 United States schools granting student loans (developing schools are not included in this data), 28 utilized all loan funds available, and all but one of these indicated a need for additional funds. In 53 United States schools, loan funds were available that were not completely used. In 21 instances funds were not used in order to maintain a reserve for use in other years or in emergencies; in 15 instances the funds on hand exceeded the student demand; there were 11 schools in which restrictions imposed by donors, university policy, or the committee administering the fund prevented full utilization; in six responses the reason for incomplete utilization was not stated.

About half of the schools in which loan funds were not completely used indicated no need for additional funds for loan purposes. It should be pointed out that probably all schools have established conditions which must be met in order for a student to be eligible to receive a loan. There are, therefore, always some restrictions that govern student loan policies so that responses indicating restrictions as the reason for incomplete utilization of loan funds are in reality dealing with the degree of restriction which manifestly is not assigned a *uniform meaning from one institution* to another. Without uniform standards and policies for both scholarship and loan fund assistance, it is not possible to interpret the degree of student need or the amount of student need that is being met by these funds.

Canadian schools grant smaller, average loans to a greater segment of their student body than do schools in the United States (table 44). Only one Canadian school has no provision for granting student loans and it indicates a need for such a program. Of the remaining 11 schools, 8 did not utilize all loan funds available, and 6 of these state that funds on hand were in excess of expressed student need. One school was unable to use all funds because of restrictions and another because of the need to maintain a revolving reserve. Both of these as well as two of the three schools which had utilized all available loan funds indicated a need for additional sums for student loan purposes.

Forty-three schools in the United States and 7 in Canada may grant loans in the course of the first year of medical school study. Thirty-eight United States and 4 Canadian schools by policy grant loans only after completion of the first year.

Table 46 expresses utilization of scholarship and loan funds as the percentage of tuition charges which funds expended in 1957-1958 could have underwritten. The combined total of scholarship and loan funds for Canadian schools represents a sum equivalent to 17.5% of their tuition charges. In United States schools under public ownership, greater emphasis is placed on student loans as opposed to schools under private ownership in which most emphasis is on scholarships. Perhaps this is to be expected since tuition charges are higher in private schools and scholarship awards would more certainly be directed toward payment of tuition. Although in public schools (United States) grants of scholarships and loans represent a greater percentage (14.4%) of their tuition charges than grants of private schools (11.9%)

Table 46.—*Expended Scholarship and Loan Funds as Percentage of Tuition Charges*

	Scholarship Funds, %	Loan Funds, %	Scholarship and Loan Funds, %
United States Schools			
Public	5.3	9.1	14.4
Private	7.3	4.5	11.9
Total	7.0	6.0	12.8
Canadian Schools	8.5	9.0	17.5

again because of higher tuition charges, the smaller percentage for private schools actually represents a greater absolute sum of money.

STUDENT EMPLOYMENT PRACTICES

To obtain information about outside work done by students for remuneration during the course of medical school studies, schools were queried regarding certain aspects of student employment practices.

Thirty-nine United States schools indicated knowledge of the percentage of each class which engaged in part time employment during the 1957-1958 school year. The school of these 39 that falls in the median position has 7.1% of its first-year class in outside employment. The range of percentage of first-year classes working is from 80% to 0% (in five of the 39 schools, there were no first year students working). The median school for the second year class had 18.5% working with a range of 91% to 0% (three schools in the latter category). The median school for the third-year class had 30% with a range of 90% to 0% (three schools), and for the fourth-year class 40% with a range of 90% to 0% (five schools).

Thirty-nine United States schools reported knowledge of the percentage of students in the second, third, and fourth year classes who were employed (1957-1958) during the school year as externs in hospitals not affiliated with the school for teaching purposes. Ten of these schools reported from 20% to less than 1% of the second year class held positions in nonteaching hospitals as externs during the school year. Twenty-eight of the 39 schools reported that from 34% to 1% of the third-year class were working as externs in nonaffiliated hospitals. Thirty schools of this group reported from 56.5% to 1% of the fourth year class externing in such hospitals during the school year.

From these data it is not possible to estimate accurately the total number of medical students who do part-time work as externs in hospitals not affiliated with medical schools. It seems apparent that there are significant numbers of students, including some in the second-year of medical study, holding such posts. Inevitably these students acquire additional experience in medicine, but, under the circumstances, serious questions can be raised as to whether this experience augments or detracts from the educational efforts of the medical school.

Since the hospitals are not affiliated with medical schools, it can be presumed that for the most part at least this experience is not acquired under the supervision of teachers directly responsible for the students' medical education. It is also possible and perhaps probable that in many instances there may be little if any competent supervision. The same reasons that give cause for concern of exploitation of the student, to the detriment of his sound educational development, also point to a concern that patients given hospital care in such situations cannot have assurance that sufficient judgment and competence are a common basis for all components of the care rendered.

GRADUATES

As was predicted a year ago, the number of graduates in the United States was larger in 1957-1958 than it had been in the previous two years, although it was not as large as the 1954-1955 graduating class, which included as graduates the 50 students completing the intern year required by Stanford University (table 21).

The net increase of 65 graduates in 1957-1958 as compared to 1956-1957 occurred because 38 schools had a total of 274 more graduates, partially offset by 42 schools having 209 fewer graduates, with no change in class size in 5 schools. Twelve schools had a more than 10% increase in number of graduates, the greatest being in schools having recently developed four-year programs such as Mississippi (up 83.4%), Miami (76.5%), and Missouri (52.4%). Other increases occurred also in Albany (22.4%), Buffalo (20%), Medical College of Georgia (19.2%), and Texas Medical Branch at Galveston (up 17.1%). Eleven schools had a decrease of graduates of more than 10%. The largest decreases were in Maryland (down 17%), Utah (15.8%), Baylor (13.3%), Vanderbilt (13.2%), Georgetown (12.1%), and University of Virginia (12%).

Based on the size of the 1957-1958 third-year class, it appears that the graduating class of 1958-1959 will be larger than any prior graduating class except that of 1954-1955. However, the second-year class size in 1957-1958, greatly augmented by the students in the developing schools in 1956-1957 and currently, indicates that a greater increase in number of graduates will occur in 1959-1960. That class will probably set a new record high for number of graduates.

The schools, medical students, and graduates in the Canadian medical schools for the past 10 years appear in table 24. Beginning with the graduating class of 1956-1957, all 12 of the Canadian schools were four-year medical schools. Comparing graduates in the individual schools in the current year and the previous one shows that seven schools had an increased number of graduates in 1957-1958, while five schools showed a smaller number of graduates in 1957-1958, for an over-all decrease of 65 graduates (down 7.2%). Though six schools (Saskatchewan, Dalhousie, Ottawa, Montreal, Alberta, and McGill) had a greater than 10% increase in number of graduates, three schools had a more than 14% decrease (Western Ontario down 33.4%, Queen's down 19.6%, and Toronto down 14.4%). However, based on the size of the third medical year class in 1957-1958, it is anticipated that the number of medical graduates in 1958-1959 will be significantly greater, possibly the largest number of graduates in the past 10 years.

THE NEXT ENTERING CLASS

Based on estimates submitted by the medical schools in the United States, the 1958-1959 entering class may be somewhat larger than was the 1957-1958 class. A total of 11 schools expected an increased number of entering students and 74 schools anticipated no change in their class sizes. No additional schools will enroll students for the first time in 1958-1959. On the other hand, there was a trifle smaller number of applicants in 1957-1958 than there were in 1956-1957 (15,791 as compared to 15,918), indicating that the increased number of applicants in 1956-1957 over the previous year may not have presaged currently a trend toward significantly more applicants over-all.

TABLE 47.—*Foreign Students in Medical Schools in the United States*

Area	Countries, No.	Students, No.
Far East	14	79
Near and Middle East	12	46
Europe	16	66
Latin America		
Caribbean	5	39
Central America	6	24
South America	8	26
North America	1	1
Africa	9	26
Oceania	3	4
Total	75	312

Canadian schools anticipated a slightly smaller entering class in 1958-1959 than in 1957-1958, based on three schools expecting to take fewer entering students while the remaining nine schools expected no change in class size.

INTERNATIONAL EDUCATIONAL EXCHANGE IN MEDICINE

In order to provide an appropriate setting for educational exchange in medicine, the following is quoted[37] from the introductory paragraphs of *Open Doors 1958*, the most recent report on international exchange published by the Institute of International Education.

TABLE 48.—*Foreign Citizens Enrolled in Entering Class of United States Medical Schools*

School Year	Foreign Students in Entering Class, No.
1954-1955	94
1955-1956	97
1956-1957	92
1957-1958	73

> The statistics in *Open Doors 1958*, the report on the five surveys conducted by the Institute of International Education during the academic year 1957-1958, emphasize the growing interest in international educational exchange. Never before have such large numbers of students, faculty members and physicians traveled to and from the United States for educational purposes. There were 52,355 foreign citizens on educational assignments in the United States during 1957-1958; this represents more than a 7% increase over 1956-1957 when 48,560 foreign citizens were reported. Of the 52,355, 43,391 were foreign students; 1,342 were foreign lecturers, professors or researchers who had received appointments to American faculties and 7,622 were foreign interns and residents at United States hospitals. Academic institutions reported 1,689 United States faculty members in teaching or research at the university level abroad. The figures on American students at foreign institutions of higher education cover the 1956-1957 academic year. The results of this survey were delayed because of the time required to receive replies from schools overseas. A total of 12,845 United States students were enrolled in foreign educational institutions in 1956-1957. Primary and secondary school teachers and students are not recorded in *Open Doors.*
>
> The foreign nationals included in Open Doors are citizens of other countries who have come to the United States for educational purposes and who intend to return home upon completion of their assignment. In some cases, however, Hungarian refugee students, whose futures are uncertain, were reported and they have been included. Institute of International Education information indicates that the total number of Hungarian students in residence this year was, however, larger than the 511 reported.
>
> The exchanges represent every major geographical and political area of the world. As in previous years the largest number of exchanges came to the United States from the Far East and the second largest number from Latin America. Thirty-three per cent of all foreign nationals in the United States came from the Far East and 20.9% from Latin America. European, Near and Middle Eastern, and Canadian citizens followed in that order. The new emphasis on academic exchanges with the countries of Eastern Europe has increased the European totals only slightly. Africa and the countries of Oceania are represented again this year by small numbers of exchanges.

TABLE 49.—*United States Citizens Studying Medicine Abroad**

	Total United States Students Abroad	United States Students in Medicine Abroad*
1954-1955	9,457	1,386
1955-1956	9,887	1,863
1956-1957	12,845	(2,000-2,200 ?)

* Excludes United States students studying medicine in Canada.

> The majority of United States citizens abroad—faculty members in 1957-1958 and students in 1956-1957—were located in Europe. The numbers going to Mexico and Canada increased, but as in previous years few Americans pursued their studies in Africa and the Near and Middle East.

The Institute's report indicates that of the more than 43,000 foreign students in the United States (89% of queried institutions responded), most were enrolled in courses in engineering (approximately 10,000) and least in agriculture (approximately 800). Of particular interest are the approximately 750 foreign students enrolled in premedical studies, approximately 1,000 in medicine (undergraduate and graduate but excluding internship and residency) and approximately 1,500 as undergraduate or graduate students in the general field of biological sciences.

FOREIGN SCHOLARS SERVING ON UNITED STATES FACULTIES

There were reported about 1,350 visiting foreign scholars (including professors, instructors, lecturers, and advanced researchers) who served on the faculties of 233 United States colleges and universities during the 1957-1958 academic year. Included in this group were almost 300 foreign scholars serving on United States medical faculties.

FOREIGN STUDENTS (EXCLUDING CANADIANS) ENROLLED IN UNITED STATES MEDICAL SCHOOLS

In 1957-1958 there were a total of 312 foreign students enrolled in United States medical schools (table 47). These students represent 75 different countries and are studying medicine in 65 United States schools. Included in this total of 312 are 73 foreign citizens who were admitted to the entering classes of 33 schools. As is evidenced in table 48 this represents a decrease over recent years.

In addition, 45 foreign students were admitted with advanced standing to the upper classes of 30 United States schools after varying years of medical study abroad. Forty-four of these students were admitted to the second (25) or third (19) year classes, and one was accepted as a senior student. The 45 foreign students admitted with advanced standing and the 73 accepted in the entering class are included in table 47. Canadian citizens are not included in these tables but are considered in the section of this report entitled, "Enrollments and Geographic Source of Entering Students."

A comparison of the number of foreign students in United States medical schools (table 47) with the number of United States citizens studying medicine abroad (table 49) is of interest. These data show from 1,700 to 1,900 more United States citizens enrolled in medical schools abroad than there are foreign citizens enrolled in United States medical schools. From a numerical standpoint, this provides for the United States a favorable balance of positions in medical schools for its students equivalent to four to five additional schools of average United States enrollment. A more qualitative view of this balance is presented in the editorial section of this issue of THE JOURNAL.

TABLE 50.—*Leading Nationality Groups of Foreign Physicians in the United States*

Nationality Group	Physicians, No.
Philippine Islands	1,598
Turkey	587
Canada	535
Mexico	500
Germany	319
Korea	313
Greece	289
Iran	279
Japan	275
Italy	230
India	225

FOREIGN PHYSICIANS TRAINING IN UNITED STATES HOSPITALS

The Institute of International Education's survey of foreign physicians training in United States hospitals was done in cooperation with this Council. Questionnaires were sent to the 1,405 hospitals approved for internships and/or residencies, with 81.1% of the polled hospitals responding.

According to *Open Doors 1958:*

> During 1957-1958, 7,622 physicians from 90 countries trained in 821 United States hospitals. Of the 7,622, 5,543 trained as resident physicians and 2,079 as interns. The total represents a general increase of 881 physicians over the 6,741 reported last year. This year physicians accounted for 14.5% of the total foreign citizen population surveyed by the Institute of International Education (table 50).
>
> The general increase in the number of foreign physicians was not limited to any particular area. Canada and the countries of Oceania showed a decrease in the number of physicians sent to this country, but an increase was recorded from the Far, Near and Middle East. The greatest increase, one of more than 25%, was shown by Africa.
>
> Of the total number of physicians 1,649 or 21.9% were women. This is an increase of 8.1% over 1956-1957 when only 13.5% were women. Sixty per cent of these women were from the Far East and almost half, 44%, were from the Philippines. As in last year's survey, the Philippines accounted for the largest number of doctors, and approximately half of the doctors sent from the Philippines were women.
>
> Foreign residents were reported in 36 fields of specialization. General surgery attracted the largest number of residents with general medicine, obstetrics, gynecology, pathology, psychiatry, pediatrics, anesthesiology, and internal medicine following in that order.
>
> Foreign physicians were training in 45 states, the District of Columbia, Hawaii, and Puerto Rico. More than 25% of all foreign physicians were located in New York and eight hospitals reported more than 50 foreign doctors (table 51).

TABLE 51—*Eight Hospitals with More Than Fifty Foreign Physicians*

Hospital	No.
Bellevue Hospital Center, New York	90
Boston City Hospital	89
Cleveland Clinic Hospital	69
Memorial Center, New York	68
Michael Reese Hospital, Chicago	64
Kings County Medical Center, New York	59
Jersey City Medical Center	53
City Hospital, Cleveland	51

UNITED STATES FACULTY MEMBERS ABROAD

During the 1957-1958 academic year, approximately 1,700 faculty members from some 350 United States colleges and universities accepted teaching and/or research assignments in other countries. Of this group, about 100 were members of medical faculties.

UNITED STATES STUDENTS STUDYING MEDICINE ABROAD

In previous reports, the Institute of International Education has collected data on the total number of United States students studying abroad and also the numbers by major fields of study. These data have always been for the academic year preceding the year of the report. *Open Doors 1958* presents the total number of United States students studying but does not break that down into major fields of study. However, by interpolating from previous Institute of International Education data, it can be estimated that in the academic year 1956-1957 there were in the range of 2,000 to 2,200 United States citizens enrolled in medical schools outside the United States and Canada (table 49).

As has been noted previously in the annual reports on medical education, the large number of United States citizens enrolled in medical schools outside the United States and Canada must be viewed with serious concern. During the three academic years covered in table 48, the ratio of applicants to admissions in United States schools has been in the range of about 2:1. Under these circumstances, it appears likely that many of the increasing number of American students now studying medicine abroad were not considered qualified for such study in United States schools.

It has been possible for the past several years to collect information regarding the numbers of American-born graduates of medical schools outside the United States and Canada who have received their initial medical licenses in the United States. This is presented in table 52. It is to be noted that the increase of more than 100 such licenses issued in 1957 over 1956 is almost entirely accounted for by New York. Of the total initial licenses issued in 1957 to American-born graduates of foreign medical schools, 70% were granted by the state of New York.

Table 52.—*Initial United States Licenses Issued to American Graduates of Foreign (Excluding Canada) Medical Schools*

Year(s)	Licenses Issued, No.	States, No.
1950-1954	99	20
1955	89	19
1956*	103	15
1957*	212	17

* Includes number of licenses issued by New York (1956—50 and 1957—151) and Pennsylvania (1956—0 and 1957—9) which were not available in other years.

It probably is of equal or even greater pertinence to know how many American-born graduates of foreign medical schools failed initial state board examinations. It is hoped that such information can be collected for presentation in next year's report.

THE EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES

This new organization whose program has been presented previously[38] went into active operation in October, 1957. The initial evaluation of a group of foreign trained physicians took place in the United States in March, 1958. Of 298 graduates of foreign medical schools whose medical credentials were found adequate, 51% (152) demonstrated satisfactory knowledge of medicine and English and were certified to this effect by the Educational Council for Foreign Medical Graduates.

Another examination of knowledge in medicine and English was conducted early this fall both in the United States and in approximately 30 testing centers abroad.

Several state licensing boards and several specialty boards have already indicated that they will require graduates of foreign medical schools to be certified by the Educational Council for Foreign Medical Graduates as a prerequisite to examination for licensure or specialty certification.

The Council on Medical Education and Hospitals, in collaboration with the Executive Council of the Association of American Medical Colleges, has prepared and circulated widely in the United States and other countries a statement indicating their support of the Educational Council for Foreign Medical Graduates. These two groups state their intention to withdraw by Jan. 1, 1960, the listing of certain foreign medical schools whose graduates have been recommended for consideration on a basis comparable to that of graduates of our own approved schools.

In place of this listing, the Council on Medical Education and Hospitals and the Association of American Medical Colleges recommend that licensing boards, hospitals, specialty groups, and other organizations in the United States concerned with the medical qualifications of graduates of foreign medical schools, consider certification by the Educational Council for Foreign Medical Graduates as evidence that the recipient of such certification is possessed of medical knowledge comparable to that expected of graduates of approved medical schools in the United States and Canada. In the interval before the Jan. 1, 1960, effective date of withdrawal of the listing of certain foreign medical schools, the Councils concerned will support the recommendations in regard to graduates of the listed schools and also the recommendation pertaining to certification by the Educational Council for Foreign Medical Graduates.

The Council on Medical Education and Hospitals has revised its *Essentials of Approved Internships and Essentials of Approved Residencies and Fellowships* to indicate that hospitals considering foreign medical school graduates for internship or residency positions are recommended to acquire reasonable assurance regarding the medical qualifications of foreign trained physicians by deferring their appointment until the candidates have been certified by the Educational Council for Foreign Medical Graduates. The American Hospital Association has supported this recommendation through appropriate notification of its member hospitals. It is expected that all graduates of foreign medical schools serving as interns or residents in United States hospitals as of July 1, 1960, will have been certified by the Educational Council for Foreign Medical Graduates.

POSTGRADUATE MEDICAL EDUCATION

A detailed study was not undertaken for the 1957-1958 year of enrollments in postgraduate courses for the continuation education of physicians or of the categories and numbers of courses and the methods of education. A fairly definitive analysis of those activities based on information collected in the year beginning Sept. 1, 1956, was presented in the 57th annual report [30] a year ago. It was felt that no useful purpose would be served by collecting and analyzing similar data for the current year. Further, the information secured from the organizations and institutions sponsoring postgraduate courses in 1956-1957 is still under study, particularly those items concerned with the geographical residence of the physicians enrolled in courses as compared to the locations of the courses offered and their subjects. Already a singular and unexpected mobility of many physicians who travel considerable distances to postgraduate courses has appeared as a significant factor. It is anticipated that the geographical study, which will be published in the next year, should provide information useful to those sponsoring postgraduate courses and related programs.

The annual list, Postgraduate Courses for Physicians, for the calendar year beginning Sept. 1, 1958, was published in The Journal, Aug. 16, 1958.[39]

EDUCATIONAL VALUES OF THE GRANTS AND TRAINING AWARDS PROGRAMS OF THE UNITED STATES PUBLIC HEALTH SERVICE

Because of their rapid growth since 1945 and their contribution and impact on undergraduate medical education, graduate education and training, and on the research activities and potentials of medical schools, any current report on Medical Education in the United States would be incomplete without presentation of the Educational Values of the Grants and Training Awards Programs of the United States Public Health Service. The following information reviewing the current status of these programs was prepared and submitted by the Office of Research Information, National Institutes of Health, Public Health Service, United States Department of Health, Education, and Welfare.

The United States Public Health Service conducts three types of programs that contribute significantly to America's supply of personnel in the medical and biological sciences. Directly concerned with research manpower are the programs that provide training grants and fellowships to nonfederal institutions and scientists. These awards will aid approximately 6,000 persons in 340 schools in 1958. Of greater magnitude, but offering educational values only indirectly, are the programs of grants for research and research construction. Lastly, there are the various intramural training programs in the Service's research centers and 72 hospitals. All these activities have grown rapidly since World War II. They have greatly increased the research and training potential of schools, have fostered activity in needed areas of investigation, and have advanced the search for basic causes of disease. They have helped expand medical knowledge and the body of professional workers skilled in its application.

The National Institutes of Health, Public Health Service research center at Bethesda, Md., spends more than two-thirds of its annual appropriations for support of nonfederal research projects and research training. The importance of National Institutes of Health to the nation's science structure and medical progress is reflected in the postwar appropriations made by Congress for research fellowships, training awards, and research grants (table 53).

A wide range of medical and biological investigations is conducted and supported by the seven institutes—the National Cancer Institute, National Heart Institute, National Institute of Allergy and Infectious Diseases, National Institute of Arthritis and Metabolic Diseases, National Institute of Dental Research, National Institute of Mental Health, and the National Institute of Neurological Diseases and Blindness. In addition to these institutes, five divisions of the Public Health Service share in the responsibility for research project and training awards. One of these, the Division of Research Grants, coordinates the grants and training programs of the institutes and administers awards programs not falling within the seven disease categories.

Table 53.—*National Institutes of Health Appropriations for Grants and Awards to Nonfederal Institutions, Agencies, and Individuals for Fiscal Years 1945, 1950, and 1955-1958*

Year	Research Fellowships	Training Awards	Research Grants
1945	$ 28,000	$ 29,000	$ 85,030
1950	1,448,057	6,415,060	13,065,514
1955	2,562,000	11,051,000	33,918,000
1956	2,800,000	14,502,000	38,038,000
1957	5,397,000	28,075,000	89,697,000
1958	6,812,000	32,560,000	90,345,000

Nine national advisory councils, composed of nonfederal leaders in medical science and public affairs, review all grant applications within their respective program areas and recommend action to the surgeon general. They are assisted by 28 study sections—panels of outstanding specialists, mostly nonfederal, who are selected by the Division of Research Grants. In addition to these specific functions, the councils and study sections, as well as various special committees, contribute over-all policy guidance in the research grant and training activities.

Below are brief descriptions of the Public Health Service programs that offer educational values. (Further information may be obtained from the Division of Research Grants, National Institutes of Health, Bethesda 14, Maryland.)

Research Fellowships

Six classes of research fellowships are available from the National Institutes of Health to qualified United States citizens (or persons who have filed a *Declaration of Intent*). Predoctoral, postdoctoral, and special research fellowships are awarded to individual applicants. Senior research fellowships and student part-time research fellowships are available through schools of medicine, dentistry, nursing, and public health. Post-sophomore research fellowships are available through schools of medicine and dentistry. Applications are processed by the Division of Research Grants, and the awards are made on a competitive basis upon recommendation by scientific committees.

The predoctoral research fellowship enables students with a bachelor's degree, master's degree, or equivalent training to pursue graduate research in the health sciences. Predoctoral fellowships are awarded for one year with assurance of support to the degree status if work continues to be satisfactory. Annual stipends for the first, second, and third years are $1,600, $1,800, and $2,000 respectively. The fellowship provides tuition, allowances of $350 for dependents, and certain travel expenses.

The postdoctoral research fellowship is awarded to candidates having an M.D., Ph.D., D.D.S., or equivalent degree. It carries a stipend of $3,800 for the first year, $4,200 for the intermediate year, and $4,600 for the third year. Dependency allowances are the same as for the predoctoral research fellowship. This year, for the first time, several postdoctoral fellowships were awarded to European scientists, enabling them to train at American medical research centers of their choice. This extension of the program is intended to promote exchange of ideas and knowledge.

Special research fellowships are awarded to qualified applicants with unusual competence in research or specialized research training. The stipend for each fellowship is determined at the time of award.

Senior research fellowships encourage highly competent scientists to conduct research in the preclinical sciences—anatomy, physiology, biochemistry, microbiology, pharmacology, pathology, biophysics, genetics, and the behavioral sciences. This program provides support between the completion of postdoctoral training and the time of eligibility for appointment to higher academic posts. Applicants must be sponsored by a basic science department of an accredited medical school, dental school, or school of public health. The fellowship provides a salary determined by the sponsoring institution. Partial research expenses up to $2,000 a year are also financed. Fellows are free to modify their research approach, to obtain additional support from the Public Health Service or other sources to conduct a portion of their research in other institutions, and to assume teaching responsibilities conducive to their academic development.

Student part-time research fellowships are designed to permit students to explore the field of research. Medical schools may request up to eight part-time fellowships in units of $600 each. Dental schools may request up to six units; schools of nursing and of public health up to four. Each unit provides for part-time research during the school term or for full-time research during two months of any period when curriculum work is not scheduled for the student.

A new type of award, the postsophomore research fellowship, was instituted in 1957. It enables medical and dental schools to help students interested in research careers to obtain essential training in the basic sciences. Participants drop out of regular course work during the training period. They receive full tuition, dependency allowances, and a stipend set by the school not to exceed $3,200.

Visiting Scientist Program

The visiting scientist program is a flexible arrangement for inviting outstanding American and foreign scientists to utilize the extensive laboratory and clinical research resources of the National Institutes of Health. Two classes of appointment are available—"visiting scientist" and "research associate in the visiting scientist program." Participants must have a doctoral degree or the equivalent background, at least six years of postgraduate experience, and exceptional ability in a specific research problem. The salary range is from $5,400 to $12,600 a year. The purpose of the program is to increase the utility of the National Institutes of Health as a national resource and to strengthen interrelations with the broader scientific community.

Training Grants

The training grants program of National Institutes of Health is intended to augment the nation's supply of qualified scientific investigators by assisting in the establishment, expansion, and improvement of training and instructional programs in professional institutions. Training grants are made to schools of medicine, dentistry, nursing, and public health. Direct aid to the institution is provided by grants in two general classes—undergraduate and graduate.

Undergraduate training grants are awarded by the National Cancer Institute, National Heart Institute, and National Institute of Mental Health. The specific purpose of this program is to establish, continue, expand, or improve instruction relating to the prevention, diagnosis, and treatment of cancer, mental illness, and cardiovascular disease or related gerontological conditions.

Graduate training grants are awarded by all seven of the institutes. The objective is to assist professional schools in establishing and maintaining graduate instructional and training programs of high caliber as well as to make funds available for the payment of trainee stipends.

Mental health career investigator grants, awarded by the National Institute of Mental Health, provide psychiatrists and scientists in related disciplines with an opportunity to acquire three to five years of full-time research training in mental health. The applicant institution, which may be a psychiatric research institution or a department of psychiatry in a medical school, pays the trainee a stipend ranging from $6,000 to $10,000 a year.

Two additional training grant programs were recently established by the National Institutes of Health—an experimental program for training undergraduate medical students in research methodology and a program of a graduate training grants in epidemiology and biometry. Both programs are administered by the Division of Research Grants. The experimental training program offers special grants to universities seeking to improve methods for training medical students for research careers. The funds paid to applicant schools include salaries of professional and nonprofessional personnel and stipends for individuals in training.

Traineeships

Traineeship awards are intended to increase the number of investigators by encouraging advanced training in specialized areas of medical research. Examples of interest are the neurological diseases, ophthalmology and sensory diseases, diagnosis and treatment of cancer, and arthritis, diabetes, and other metabolic diseases.

Regular or special traineeships are awarded directly to American citizens having a doctoral degree in health fields, including related biological and behavioral sciences. Traineeships are available through the National Cancer Institute, the National Institute of Arthritis and Metabolic Diseases, and the National Institute of Neurological Diseases and Blindness. The National Heart Institute and the National Institute of Mental Health provide traineeships under training grants awarded to institutions for this purpose.

The regular traineeship carries a first-year stipend of $3,800, a second-year of $4,200, and a third-year of $4,600, plus dependency allowances of $350 and certain travel allowances. No allowances are made for tuition or supplies.

Special traineeships are awarded in varying amounts to qualified individuals who possess unusual competence for training or who require specialized training for a specific problem. The trainee may study at the institution of his choice. The stipend is determined by the particular training needs of the applicant. The National Institute of Neurological Diseases and Blindness awards special traineeships only to those who have completed residency requirements in a specialty.

Recent amendments to the Public Health Service Act provide traineeships for professional health personnel, supplementing the training activities of state and local governments. The program is administered by the Division of General Health Services, Bureau of State Services. Its primary purpose is to bring new people into the field of public health—physicians, dentists, nurses, and other professional health workers who have completed their basic education. Preference is given to applicants under 35 who have had no more than two years experience in public health work and have had less than a year of graduate or specialized training in public health. Consisting of stipends, tuition, and certain allowances, the awards are paid directly to participants, with the exception of those made available through schools of nursing and of public health. Stipends range from $2,400 to $4,800, according to the applicant's academic degree.

Another amendment to the Public Health Service Act provides traineeships to prepare nurses for teaching, supervision, and administration in all fields of nursing including public health. Stipends of $2,400 to $3,600 plus tuition, certain travel fees, and dependency allowances of $360 are available through schools of nursing. This program is administered by the Division of Nursing Resources, Bureau of Medical Services.

Research Grants

Research grants support medical research on all major health problems and in basic sciences related to medicine. Each institute makes grants for research within its area of interest, and the Division of Research Grants supports studies outside the scope of the seven institutes. The program is intended to increase research in medical, dental, and other professional schools and institutions and to stimulate investigations in scientific areas needing exploration. A sizable portion of the grants is devoted to basic research. The program aids indirectly in training junior personnel employed in the research projects.

The research grants constitute by far the largest program of Public Health Service awards, both in terms of money expended and the number of institutions affected. Appropriations supported approximately 6,000 such grants in 1957.

Field investigation grants, awarded by the National Cancer Institute, support developmental research, community studies, and surveys that will contribute to the prevention, control, diagnosis, and treatment of cancer in the general population.

The National Institutes of Health cooperate with the two service bureaus of the Public Health Service in administering grants for special research projects. Among these are investigations of the health aspects of air and water pollution, projects for the development and utilization of hospital facilities and resources, and studies to improve nursing education and service. The projects are administered by the Division of Research Grants for the sponsoring divisions in the Bureau of State Services (the Division of Sanitary Engineering Services and the Division of General Health Services) and in the Bureau of Medical Services (the Division of Hospital and Medical Facilities and the Division of Nursing Resources).

Health Research Facilities

In 1956 Congress approved a three-year program of construction grants to accelerate the building and equipping of urgently needed new laboratories and other health research facilities. Thirty million dollars was appropriated and granted in fiscal year 1957; another 30 million dollars has been appropriated for 1958; and present authorization includes 30 million dollars for one additional year. Applications submitted by nonfederal public and private institutions to the Division of Research Grants are evaluated by the National Advisory Council on Health Research Facilities, which in turn recommends action to the surgeon general. The construction projects are financed on a matching basis.

Training for Public Health Service Careers

The Public Health Service, in its widespread and diversified programs, offers many career opportunities to competent physicians. Training is provided in various areas of medicine, including patient care, clinical research, basic laboratory research, epidemiology, preventive medicine, quarantine duty, foreign service, and public health administration.

Most of the Service's physicians are officers in the Commissioned Corps, which has served this country with distinction since 1873. A young physician or medical student may enter the Corps (1) through the Commissioned Officer Student Training and Extern Program (COSTEP), (2) as an intern upon graduation from medical school, and (3) as a medical officer after non-Service internship.

Clinical assignments are available in most of the Service's 16 general and special hospitals and in many of its 56 hospitals for American Indians and Alaskan natives. Postgraduate medical education in the teaching hospitals is conducted by chiefs of service (who are certified or eligible for certification by their specialty boards), with the assistance of well-qualified personnel and outstanding consultants from local hospitals and medical schools. Approved internships are also offered in dentistry, dietetics, and pharmacy.

Rotating internships consisting of assignments planned to round out a young physician's education are available in the Service's hospitals at Baltimore, New Orleans, New York, Norfolk, San Francisco, Seattle, and Boston. The schedule provides four months of medicine, four of surgery, two of pediatrics, and two of obstetrics. Mixed internships, available at the Public Health Service hospital in Boston, provide six months of medicine and six of surgery.

In addition to the usual educational requirements, the applicant for appointment as a medical intern must (1) be in good health, (2) be an American citizen, and (3) submit an application for a reserve commission in Public Health Service. Those who have satisfactorily completed the year's internship may apply for continuing assignment with the Service. They are eligible to take the examination for appointment in the Regular Corps.

In addition to internships, Public Health Service hospitals offer approved residency training in the following specialties: surgery, general practice, internal medicine, orthopedics, urology, anesthesiology, dermatology and syphilology, ophthalmology and otolaryngology, pathology, radiology, and psychiatry. The National Institutes of Health Clinical Center, 500-bed research hospital at Bethesda, Md., offers residency training in internal medicine, neurology, ophthalmology, pathology, psychiatry, and radiology. Residents are usually selected from the Commissioned Corps.

Through the Commissioned Officer Residency Deferment (CORD) program, Public Health Service offers qualified physicians the opportunity to obtain deferment from military service under the Universal Military Training and Service Act. Physicians are commissioned in the Reserve Corps of Public Health Service and deferred from active duty to obtain residency training in essential specialty fields. After completion of training, participants must serve their obligatory time with Public Health Service. No additional military service is required.

The program known as COSTEP provides employment for a limited number of medical and dental students during the vacation months for duty at Public Health Service hospitals, research laboratories, and other facilities. Appointments are offered to students who will have completed their sophomore year of professional education by July 1 and are interested in becoming reserve officers in the Commissioned Corps.

Inquiries concerning employment in the Public Health Service may be obtained from the Surgeon General, United States Public Health Service (P), Washington 25, D. C.

Conferences and Seminars

To encourage early and adequate exchange of information among investigators, numerous conferences, seminars, and symposiums are supported in connection with the grants and training programs. Many of the meetings are initiated and sponsored by the advisory study sections of the Division of Research Grants.

In addition, the institutes, separately or as a whole, present lectures, seminars, and clinical conferences. Frequently there is active participation by faculty members of universities and medical schools, staffs of other research centers and Public Health Service hospitals, physicians in private practice, and other leaders in the medical sciences.

Research workers met at a conference held in 1957 under the auspices of the Surgery Study Section to discuss developmental, technical, and clinical problems in extracorporeal circulation. The Sensory Diseases Study Section, in hopes of stimulating interest among young investigators, assembled experts in retinal physiology, biochemistry, optical physics, and psychology to discuss the present status of knowledge of visual mechanisms within the eye and brain.

The Radiation Study Section sponsored a series of conferences in 1957 and 1958 to facilitate the application of radiobiological knowledge to the treatment of cancer. Work conferences on research training for nurses and on special clinical training in cardiovascular nursing were inaugurated by the Nursing Research Study Section in 1958. The Biophysics and Biophysical Chemistry Study Section sponsored regional conferences in 1956 and 1957 to help determine how best to provide training and develop research in the theory and practice of medical-science instrumentation, and in 1958 the Section held two conferences to explore research and training opportunities for scientists and mathematicians in the new field of physical biology.

A postgraduate course on research in cardiovascular disease was given by National Institutes of Health for the American College of Physicians in the fall of 1957, and other courses for the College are planned. Meetings such as those supported by the National Institute of Mental Health provide orientation and training in specific services—the annual conferences, for example, on the reporting of mental hospital statistics. The National Institutes of Health also provides personnel and exhibits for medical and scientific meetings of state, regional, national, and international scope.

THE NATIONAL SCIENCE FOUNDATION

The following résumé of the activities of the National Science Foundation, in so far as they are related to medicine through grants for basic research in the medical sciences, grants for short-term medical research, and fellowships for study at the graduate and postdoctoral level, has been submitted by the Public Information Office of the Foundation.

The National Science Foundation, an agency of the federal government, was established by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." The foundation carries out its mission by supporting basic research in the sciences, programs for improving science education, conferences and symposia on specific aspects of science, studies of manpower supply and demand, programs for making scientific information more readily available, and the compilation of data on the national effort in scientific research and development.

Of particular interest to the medical profession are the foundation's grants for basic research in the medical sciences, grants for short-term medical research, and fellowships for study at the graduate and postdoctoral level (table 54).

Basic Research

Grants are made to help competent scientists conduct basic research in the sciences, principally at universities and colleges. Normally, proposals are originated by the scientist and are endorsed and submitted by his institution. Basic Research is supported in the mathematical, physical, medical, biological, engineering and other sciences, including to a limited extent, the social sciences. In 1957, the Congressional appropriation to the foundation for the support of basic research was $15,500,000. Approximately $7,360,000 was expended in support of the life sciences. In 1958, the appropriation for the support of basic research was $19,400,000, with approximately $8,000,000 for the life sciences.

TABLE 54.—*NSF Support of Activities (Research and Conferences) of Interest to Medical Profession*

	Fiscal Year 1957		Fiscal Year 1958	
	Number	Amount	Number	Amount
Basic medical research grants....	22	$407,200	24	$559,600
Short-term research by medical students..............	16	194,400	17	193,200
Conferences and symposia on subjects of medical interest.....	3	18,000	1	20,000

Short-Term Medical Research

In an effort to increase the number of scientists qualified to perform basic research in medical fields, the foundation sponsors a program designed to encourage medical school students to pursue careers in research.

Medical school students constitute one of the largest sources, relatively untapped, of medical research scientists. The medical curriculum is essentially instructional, offering little, if any, opportunity for students to pursue research and become familiar with its methods or challenges. The foundation seeks to introduce medical students to the techniques of basic research by means of its grants to medical schools for the support of short-term research by students during free-quarter periods. Without interfering with the medical curriculum, the program provides opportunities for carefully selected students to determine their interest in and aptitude for research. Student research is conducted under the supervision of qualified members of the medical school staff.

In 1956, the foundation began this program experimentally. In the three years of its operation, the program has expanded considerably and now includes 34 medical schools in the nation. A total of $467,250 has been granted for this purpose.

Conferences and Symposia

The conferences and symposia supported by the foundation provide excellent opportunity for the interchange of information and ideas among experienced investigators, as well as an opportunity for younger investigators to meet and obtain information and advice from some of the world's foremost scientists. Approximately 25 such conferences are supported each year. In 1957 there were three such conferences of special interest to those in the medical profession and in 1958, one (table 54).

Additional information on the support of research grants in the medical sciences may be obtained from the Division of Biological and Medical Sciences, National Science Foundation, Washington 25, D. C.

Fellowships

The Fellowship Program of the foundation is designed to strengthen the nation's potential by providing support for advanced training in the sciences directed toward the development of highly qualified research scientists and for further study in the sciences directed toward increasing the competence of college science teachers.

Fellowships are offered for graduate study in the physical, medical, biological, and engineering sciences; anthropology and psychology (excluding clinical); and geography, certain interdisciplinary fields, and selected social science fields. These fellowships are limited by law to citizens of the United States. A Fellow may study under his award at any accredited nonprofit institution of higher education in the United States or any similar institution abroad approved by the National Science Foundation.

Awards are *not* made to individuals to pursue a course of study designed to prepare them for careers in medical practice or other clinical fields; applications are accepted, however, from students who intend to obtain advanced training in one of the medical sciences directed toward a career in research. An individual who holds a degree such as M.D., D.D.S., or D.V.M. and desires to continue training for a career in research is eligible to apply for a postdoctoral award provided he can present an acceptable plan for study and research.

Four types of fellowships are offered—the Predoctoral, Regular Postdoctoral, Senior Postdoctoral and Science Faculty. The predoctoral program is open to students studying for masters or doctoral degrees in science. The three predoctoral levels, first-year, intermediate-year, and terminal year, carry base stipends of $1,600, $1,800, and $2,000, respectively, with allowances for travel and dependents. Approximately 1,000 predoctoral fellowships were awarded during 1958.

The regular postdoctoral program is available to those who have earned a doctoral degree or have had research training and experience equivalent to that represented by such a degree. The stipend is $3,800 with allowances for travel and dependents. These awards are made semiannually, and approximately 125 were made in 1958.

The objective of the senior postdoctoral program is to provide senior, established scientists an opportunity to increase their competence as investigators in their own or related fields. These scientists should have held their doctoral degree for a minimum of five years. A salary-matching stipend is awarded, up to a maximum of $12,000. Approximately 75 such fellowships are awarded each year.

To increase the effectiveness of the teaching of college science teachers, the foundation awards annually science faculty fellowships to teachers with three years college teaching experience and plan to continue teaching. A salary-matching stipend is given, up to a maximum of $12,000. Approximately 180 such fellowships were awarded in 1958.

During fiscal year 1957, 34 fellowships were awarded in the medical sciences. There were 20 predoctoral, 9 regular postdoctoral, 2 senior postdoctoral, and 3 science faculty fellowships. During fiscal year 1958, 41 fellowships were awarded in the medical sciences—15 predoctoral, 18 regular postdoctoral, 5 senior postdoctoral, and 2 science faculty.

Additional information on the Predoctoral and Regular Postdoctoral Fellowship Programs of the National Science Foundation may be obtained from the Fellowship Office, National Academy of Science-National Research Council, Washington 25, D. C.

Additional information on the Senior Postdoctoral and Science Faculty Fellowship Programs may be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C.

CONTRIBUTIONS OF THE OFFICE OF VOCATIONAL REHABILITATION TO MEDICAL EDUCATION AND RESEARCH

Since 1954 the Office of Vocational Rehabilitation, under authority of the Vocational Rehabilitation Act, has offered direct and indirect aid of five types to medical education and research. The following summary of the various grant programs administered by the Office of Vocational Rehabilitation which have an impact on medical education has been prepared by its administrative staff for the education number of THE JOURNAL.

The Office of Vocational Rehabilitation, Department of Health, Education, and Welfare, offers direct and indirect aid to medical education. Direct aid is available in the form of long-term teaching grants and short-term course or institute grants to the schools. Less direct but significant support is provided through research grants, research fellowships, and traineeships. These five types of aid, made possible under authority of the Vocational Rehabilitation Act of 1954, may be summarized as follows:

1. Teaching grants for long-term training assist the schools in initiating, expanding, or improving teaching in the rehabilitation phases of medicine. The number of medical schools receiving teaching grants has increased from 6 in 1956 to 25 during the current academic year. Averaging from $15,000 to $25,000, the grants are intended to provide part of the costs of the teaching program. Generally, they cover the salary of a faculty member coordinating the program, payment for the part-time services of supporting staff, and the purchase of instructional equipment or materials. The duration of these grants is one academic year with provision for reapplication by the institution for continued support.

2. Short-term course grants are made to medical institutions to stimulate interest and to increase knowledge regarding the potentialities of rehabilitation. Funds from this source may also be used to pay part of the costs incurred by those in attendance. During the past year, specialized courses were conducted in geriatric rehabilitation, the teaching of esophageal speech, and administrative problems encumbered by physicians engaged as medical consultants in the state-federal vocational rehabilitation program. Short-term courses dealing with prosthetic rehabilitation of the upper extremity amputee and the above-knee amputee reached in 1957 an estimated 600 physicians, physical therapists, occupational therapists, and prosthetists.

3. Traineeship grants in medicine serve the purpose of increasing the nation's supply of qualified physiatrists. They were given during the past academic year, to 25 institutions offering approved residency programs in physical medicine. From this source the institutions, in turn, awarded traineeships to individual physicians. The number of physicians receiving this type of support has increased from 4 in 1955 to 139 during the past academic year. Expenditures for such traineeships, which averaged $6,000 per trainee, increased from $287,500 in 1956 to $650,000 in 1958.

Office of Vocational Rehabilitation funds have also been used in several institutions to establish part-time courses in rehabilitation methods and concepts for graduate physicians engaged in residencies in neurology, neurosurgery, orthopedics, psychiatry, urology, plastic surgery, etc.

4. Research and demonstration grants are available for the partial support of projects aimed at developing more effective methods and techniques for the vocational rehabilitation of the more severely disabled. Although no specific matching is required, sponsors of current active projects are carrying an average of 33% of the total cost of the projects. Research and demonstration grants are recommended for approval by the National Advisory Council on Vocational Rehabilitation which is composed of medical, educational, and scientific members who are established authorities in fields concerned with vocational rehabilitation.

Projects are being encouraged in the following categories: (*a*) studies designed to determine physiological changes which occur during treatment and retraining in physical rehabilitation; (*b*) the development of new and improved diagnostic techniques; (*c*) investigations to elucidate the dynamics of individual and group motivation as a factor in success or failure of physical medicine procedures; and (*d*) projects for developing quantitative methods for evaluating functional capacities of disabled individuals.

5. Research fellowships may be awarded to assist qualified candidates to pursue advanced training for research in rehabilitation or to undertake a research project which holds promise of advancing knowledge of the vocational rehabilitation of disabled persons. Three types of fellowship are available: predoctoral, postdoctoral, and special. The awards are made on an annual basis and are subject to a limitation of two years.

The programs of the Office of Vocational Rehabilitation in aid to medical education are based on long-standing practices of cooperation with state and local agencies and medical institutions. National advisory committees play a major role in the administration of the office's educational grants program. These committees, composed of leaders in the educational, research, and administrative phases of the various rehabilitation disciplines, have helped to formulate the policies and basic principles which govern the grant programs for medical education. Academic freedom for the institutions and individuals receiving grants is a primary consideration. The intent of Congress, the recommendations, of the advisory committees, and the traditions and experience of the Office of Vocational Rehabilitation provide maximum safeguards for that freedom. In carrying out the over-all program, every effort is made to insure the widest distribution of funds, taking into consideration the number and quality of the projects and the available resources.

UNDERGRADUATE AND GRADUATE MEDICAL TRAINING PROGRAMS IN THE VETERANS ADMINISTRATION

The following material reviewing the Undergraduate and Graduate Medical Training Programs in the Veterans Administration has been submitted by the Director, Education Service, Research and Education, Department of Medicine and Surgery of the Veterans Administration.

The Veterans Administration medical school relationship which resulted from the 1946 congressional action organizing a Department of Medicine and Surgery within the Veterans Administration had as its principal purpose the organization and supervision of graduate training programs in Veterans Administration hospitals by medical school faculties. This relationship was formalized by a policy memorandum issued Jan. 30, 1946, and at that time undergraduate medical education was not considered in establishing the Veterans Administration medical school relationship.

On Nov. 21, 1957, nearly 12 years after the inauguration of this relationship, a letter survey was made of all Veterans Administration hospital managers and all deans of associated medical schools asking for a reevaluation of the Veterans Administration medical school relationship. The results of this survey will be reported in another publication at a future date, but the significant feature of the replies was a unanimous endorsement and recommendation for continuing the relationship. This relationship has endured for 12 years because it is mutually beneficial to both the medical schools and the veterans hospital.

TABLE 55.—*Veterans Administration Residents, April, 1958*

	Career Residents	All Other Residents	Total Residents
Allergy	0	4	4
Anesthesiology	11	67	78
Cardiology	0	8	8
Dermatology	0	30	30
Gastroenterology	0	5	5
General surgery	0	696	696
Internal medicine	0	644	644
Neurology	17	18	35
Neurosurgery	0	34	34
Ophthalmology	0	63	63
Orthopedic surgery	0	111	111
Otolaryngology	0	29	29
Pathology	7	82	89
Physical medicine	23	7	30
Plastic surgery	0	11	11
Psychiatry	184	186	370
Pulmonary diseases	0	13	13
Radiology	20	133	153
Thoracic surgery	0	26	26
Urology	0	86	86
Totals	262	2,253	2,515

UNDERGRADUATE MEDICAL EDUCATION

For the academic year 1957-1958, 62 medical schools assigned 6,022 medical students to Veterans Administration hospitals of which 4,917 (82%) were third and fourth year clinical clerks. Many others assigned students on other than clerkship basis. Eighteen Veterans Administration hospitals received 100% of the third year medical school class and 16 hospitals received 100% of the fourth year medical school class for clerkship training.

GRADUATE TRAINING PROGRAMS

Table 55 indicates that residency training is conducted in 20 medical specialties in Veterans Administration hospitals. As of April 15, 1958, there were 2,515 residents on duty of which 262 were "career residents" receiving the pay of full-time physicians in return for a contractual obligation to serve specified periods of obligated service at the conclusion of their formal residency training.

While all authorized residency positions are filled, the facilities of Veterans Administration hospitals would permit significantly greater numbers of residents to be trained provided both funds and resident candidates were available. The actual capacity of Veterans Administration hospitals engaged in residency training is 3,806, although this number of positions has never been offered at any time.

The 2,515 residents on duty in Veterans Administration hospitals represent 82% of all reported residency appointments in the federal services and represents 11% of all residency appointments throughout the United States.

Veterans Administration hospitals participate in 626 different individual residency programs. Of these, 29% are conducted as integrated programs by combination with university programs in the community. They are, therefore, not independently approved and are usually listed in THE JOURNAL of the American Medical Association under an "indented" heading. Three hundred and eight (49%) are independently approved in the name of the Veterans Administration but are conducted in collaboration with other approved programs. Sixty-two (10%) are conducted on an affiliate basis with approval for such programs resting in the name of another hospital than the Veterans Administration. Forty-seven (7%) are independently approved and conducted without any outside collaboration or affiliation, while 42 (5%) of the programs are now pending approval.

FOREIGN MEDICAL SCHOOL GRADUATES

During the past fiscal year, 168 residents were graduates of foreign medical schools, and 16 of the total were graduates of Canadian medical schools. In addition to the above United States citizens who were graduates of foreign schools, 89 noncitizen residents were serving on a "without compensation" basis by assignment from university hospitals. Twenty-six noncitizens were assigned with Veterans Administration hospitals having residency training programs on a "guest student" basis to act as observers only and not to participate in residency training programs from the standpoint of assuming responsibility for patient care.

Recognition of the approved status of Canadian medical schools finds expression in a relaxation of the previous requirements for citizenship. At present, a noncitizen who is a graduate of an approved Canadian or American medical school may be employed as a resident in Veterans Administration hospitals. United States citizens who are graduates of other foreign medical schools may not be employed unless holding certification from the Educational Council on Foreign Medical Graduates, Inc.

RESIDENT COMPENSATION

Subsequent to congressional action improving the pay status of federal employees, the maximum stipend for residents was increased on July 1, 1958. Board, room, and laundry cannot be provided free to residents, and therefore these costs must be deducted from the resident's stipend if provided by the Veterans Administration hospital. Table 56 reveals the current maximum stipends for medical residents. Each deans committee determines the actual stipend level within the permissible maximum.

NATIONAL DEFENSE AND MEDICAL EDUCATION

SELECTIVE SERVICE SYSTEM

The following information, current as of July 1, 1958, has been submitted by the Selective Service System National Headquarters.

The responsibility for primary classification of registrants rests with Selective Service local boards. If a person or his employer (college, medical school, or hospital) has requested his deferment and he has been classified as available for military service, the person or his employer may, within 10 days of the mailing of the notice of classification, file an appeal. The appeal will be reviewed ordinarily by the appeal board having jurisdiction where the registrant's local board is located, but it may be transferred for review to the appeal board having jurisdiction in the area where the registrant is working or attending college if this is requested in writing when the appeal is made. If the state appeal board should sustain the classification, the registrant or his employer may, if there is a dissenting vote in the appeal board, file a written request with the local board to have the decision appealed to the President. If there is no dissenting vote, the state or national director of Selective Service may appeal the case to the president.

The "college student certificate," SSS Form 109, continues to be prescribed for the use of institutions of higher learning, including those of medicine, in furnishing the local boards information regarding registrants who are enrolled as students in those institutions. These forms should be submitted to the local boards by the educational institution on request of the registrant. However, the mere filing of such a form does not constitute a request for occupational deferment, since, in order to establish the right of appeal as an interested party, a written request from the college or employer for occupational deferment must accompany the form. The registrant has the right of appeal if exercised in the prescribed 10 days. He may make his appeal informally in writing.

Eligibility for Consideration for Deferment

The law empowers the President to provide for the deferment of any person whose deferment is equitable and in the national interest. Furthermore, it is the sense of Congress that provision should be made for the annual deferment from training and service of premedical, predental, and allied preprofessional students in numbers equal to those at present (1950) in attendance at colleges and universities as outlined in the general student deferment program.

Sections 1622:15 and 1622:25 of the Selective Service Regulations specify the conditions under which students pursuing programs of higher education may be considered for deferment. Within these specified requirements, students of the healing arts are considered for deferment in the same manner as students pursuing other undergraduate or graduate courses at colleges, universities, and similar schools.

Any student not previously deferred who is pursuing a full-time course of study is entitled to a single period of statutory deferment, class 1-S, until the end of the academic year. Such deferment does not preclude the possibility of later deferment in class 2-S. Students whose activity in study, research, medical, or other endeavors is found necessary to maintenance of the national health, safety, or interest may be deferred in class 2-S until completion of their college training, provided they maintain satisfactory scholastic records. A student who is deferred for study extends his liability for military training and service up to his 35th birthday instead of his 26th, as prescribed for registrants who have never enjoyed a deferment.

TABLE 56.—*Resident Stipends (Maximum)*

	Per Year
Junior resident	$3,250
Intermediate resident	3,515
Senior resident (first year)	4,165
Senior resident (second year)	4,945
Senior resident (third year)	5,545

In selecting a student for deferment in class 2-S, the Selective Service local boards may, at their discretion, be guided either by the score made by the student on the Selective Service College Qualification Test or by his record of academic performance. The college qualification test is given for the Selective Service System by the Science Research Associates, Inc., of Chicago. At present, in order to be eligible for deferment on the basis of this test, an undergraduate student must make a score of 70 or more. SSS Form 108 has been prescribed for furnishing to the local board the score made on this test. This score is confidential and may be divulged by the local board only to the registrant or to one holding his written consent.

To qualify for deferment on the basis of academic performance, the nonprofessional student must have maintained the following standing among the male members of his class: freshman year, upper one-half; sophomore year, upper two-thirds; and junior year, upper three-fourths. A student accepted for admission to medical school after July 1, 1951, for the class next commencing may be deferred, provided that, during his last full-time year at college or university, he was ranked among the upper one-half of the male members of his class or had a score of 70 or more on the Selective Service College Qualification Test.

A student accepted for admission by a graduate school after July 1, 1951, as a full-time student for the class next commencing may be deferred provided that, in his last full-time academic year in a college or university, he achieved a scholarship standing among the upper one-fourth of the male members of his class or scored 80 or more on the qualification test and provided that the graduate school certifies that he is meeting the degree requirements. Decisions concerning deferment of American students enrolled in foreign universities, including medical students, are the responsibility of the local boards. The local board may accept or reject any claims or evidence presented for deferment.

Status of Interns and Residents

The Selective Service System has always recommended the deferment of graduates of medicine to complete one year of internship training. Selective Service has stated that men, to be given favorable consideration for deferment to complete a residency or more than one year of internship, should be absolutely essential to the operation or maintenance of the hospitals where they are employed or that they be among those selected by the surgeon general of the United States Public Health Service and recommended for specialty training necessary in the staffing of the hospitals of the United States Public Health Service. The Selective Service System is of the opinion that there is a sufficient number of young physicians who have satisfied their military liability or who are physically disqualified for military service to satisfy the requirements of the hospitals for residents and to provide for specialty training for civilian needs.

The Selective Service has agreed to recommend to the Selective Service local boards the deferment of men in a number not to exceed 300 as an over-all total for the surgeon general of the United States Public Health Service. It is expected that this program may be continued from year to year.

All young physicians participating in this program are to be commissioned in the reserve component of the Public Health Service, and they are to be selected by the surgeon general of the Public Health Service for such training. The request for deferment is to pass from the individual to the surgeon general of the Public Health Service and then, if recommended, will be forwarded through national headquarters of the Selective Service System to the respective local boards of that system.

Those graduates of medicine who accept a commission in the medical corps reserve of an armed force will not be used, according to present Selective Service policy, to fill a regular call; therefore, such young men who are accepted in the Berry Plan and who accept reserve commissions will be classified by their Selective Service local boards in a class indicating that they are members of the reserve forces. Should it become necessary for the Department of Defense to place with Selective Service a special call for doctors of medicine, such men will then be given consideration for deferment from active duty for such period of time necessary to complete their training.

A young physician who has established himself in a community where he has been found by his local board essential to the maintenance of an adequate medical service in that community may be deferred by his Selective Service local board or such a physician may be deferred for teaching, research, or Public Health work when these are considered by the local board to be essential in the national interest.

For the academic year 1958-1959, the Public Health Service has arranged certain research grants for students who have completed two years in medicine. These grants will be for one year, and the deferment of these special men will be requested by the individual registrant and recommended by the surgeon general, United States Public Health Service.

Status of Faculty Members

No policy has been announced by the Selective Service System on the granting of deferment to faculty members, except that teachers of medicine have been mentioned in a Selective Service Operations Bulletin as being in a critical occupation to which local boards should give special consideration. It has been recommended that as a general policy, essential members of the medical, dental, and veterinary faculties be held in their teaching positions until such time as replacements are found. This recommendation applies especially to persons in the basic science departments. This policy is not a blanket recommendation for deferment from military service for all teachers. Part-time teachers, who devote only a small portion of their time to teaching, will be expected to enter the military services. The President is also directed to establish a national advisory committee to advise the Selective Service System and to assist state and local advisory boards in selecting the needed medical, dental and allied personnel.

Expiration of the "Doctor-Draft" Law

The August, 1957, issue (vol. 7, no. 8) of Selective Service carried a statement regarding the expiration of the "Doctor-Draft" law and the new legislative provisions for "Specialists' Service." Because of its importance from the standpoint of medical education as well as its implication in medical practice, this statement is presented in full in the following paragraphs.

"Doctor-Draft" Law Expires; New Legislation Provides for Specialists' Service

Amendments to the Universal Military Training and Service Act, as amended, adopted in June, 1957, replace the former "Doctor-Draft" law and provide for meeting the requirements of the Armed Forces for medical, dental, and allied specialists until June 1, 1959. Under the new amendments only those specialists who are otherwise liable as regular registrants are subject to induction under the Selective Service Law.

The old "Doctor-Draft" law under which medical, dental and allied specialists had been liable since 1950 expired July 1, 1957. It had placed liability for service on older doctors, dentists, and allied specialists, at one time up to the age of 51.

One of the principal effects of the new amendments to the basic Selective Service Law is to limit liability of doctors, dentists and allied specialists to age 35 for those deferred on or after June 19, 1951, and to age 26 for others. Public Law 85-62, which amends the basic Selective Service Law with respect to these specialists, was signed by the President on June 27, 1957. By placing medical, dental, and allied specialists under the same provisions of law and regulations as other registrants with respect to the upper limit of the age of liability, the 1957 amendments relieve from liability under the Universal Military Training and Service Act, as amended, any such specialist over the age of 32 on the date the amendments became effective—July 1, 1957. This is true because in order to have acquired extended liability under the June 19, 1951, amendments, a registrant must not only have been deferred on or after that date, but also must not have attained the 26th anniversary of his birth by that date. Any man who was 26 on June 19, 1951, would, on July 1, 1957, have been 32 years old.

The amendments in addition provide that

1. No person in the medical, dental, and allied specialist categories shall be inducted if he applies for an appointment as a reserve officer and is or has been rejected for such an appointment on the sole ground of physical disqualification.

2. The President may order to active duty for not more than 24 consecutive months any member of a reserve component who is such a specialist, who is under 35, and who has not performed at least one year of active duty in the armed forces.

3. Any such person called or ordered to active duty from a reserve component of the armed forces and who serves on active duty as a specialist for 12 months or more, shall upon release from active duty or within six months be given an opportunity to resign the commission unless he is otherwise obligated to serve in active training and service in the armed forces or in training in a reserve component by law or contract.

4. Any physician or dentist qualified for a reserve commission shall, so long as need for his services exists, be given an opportunity to volunteer for active duty of not less than 24 months.

5. The President may prescribe rules and regulations for the selection or induction of persons by age group or groups and for the selection and induction of persons qualified in needed medical, dental, or allied specialist categories pursuant to requisitions submitted by the Secretary of Defense.

6. Qualified specialist aliens liable for induction shall not be held ineligible for appointment as commissioned officers solely on the grounds that such alien specialists are not citizens or have not declared their intention of becoming citizens.

7. Any qualified person who is liable for induction, or who is ordered to active duty as a member of a reserve component as a physician, or a dentist, or in an allied specialist category, shall be appointed, reappointed, or promoted to such grade or rank as may be commensurate with his professional education, experience, or ability provided that any person in a needed medical, dental, or allied specialist category who fails to qualify for, or who does not accept, a commission, or whose commission has been terminated, may be used in his professional capacity in an enlisted grade.

8. Periods of active duty performed by such specialists in student programs prior to receipt of appropriate professional degree or in intern training shall not be counted toward establishing the qualification of such specialists for classification as a veteran exempt from liability for training and service.

9. It is the sense of Congress that the President provide for deferment of optometry students and premedical, preosteopathic, preveterinary, preoptometry and, predental students in numbers at least equal to the numbers of such male students now studying in colleges and universities.

10. Public Law 62, 85th Congress, amending the Universal Military Training and Service Act, as amended, to provide service liability for persons in medical, dental and allied specialist categories, expires on July 1, 1959.

With the expiration of the requirement for special registration of medical, dental, and allied specialists, such specialists under the amendments of June 27, 1957, should notify their local boards within 10 days of the attainment of degrees in these fields.

ARMY, NAVY, AND AIR FORCE PROCUREMENT PROGRAMS

The following information summarizing the Army, Navy, and Air Force procurement programs has been submitted by the office of the Assistant Secretary of Defense (Health and Medical), current to June 26, 1958. It has been prepared so as to present a general portrayal of current procurement programs in the medical branches of the armed services insofar as they concern undergraduate and graduate medical education.

Army

EARLY COMMISSIONING PROGRAM FOR MEDICAL STUDENTS

Medical students may apply for commissions in the grade of second lieutenant, Medical Service Corps, Army Reserve, while attending medical school. Students participating in this program will be obligated to accept superseding appointments in the grade of first lieutenant, Medical Corps, Army Reserve, upon graduation and, in accordance with the needs of the active Army may be required to serve on active duty for a period of two years upon completion of internship. Persons appointed under this program are assigned to Ready Reserve Units in appropriate medical corps vacancies in TOE and TD troop program units, USAR Schools, and USAR Control Groups (Annual Training).

Every effort will be made to place officers commissioned under this program on active duty on a date desired by them; however, no assurance can be given that they will be ordered to active duty at a particular time, since such action is contingent upon programmed requirements of the active Army.

Participation in this program will not in itself increase the active service liability or obligation of the participant. However, participants will be required to certify to their understanding that appointment prior to attaining age 26 incurs an obligation for active participation in the Reserve training unless excused under regulations prescribed by the Secretary of the Army.

Clinical Clerkship Training Program

Participants in the Clinical Clerkship Training Program will be medical students at the sophomore-junior and/or junior-senior level, who now hold appointments in the Medical Service Corps, Army Reserve, as lieutenants, or will be commissioned in sufficient time to participate in the program. A limited number may also participate in the program as "student employees" under Civil Service. Students in Army Reserve status who are selected for this clinical clerkship must volunteer to perform not more than 60 days of active duty for training, including travel. Students who are assigned to a USAR Control Group (annual training) and are selected for the clerkship will fulfill their annual requirement for active Reserve participation by performing the above period of active duty for training. The students who are assigned to a TOE or TD Reserve Unit, or a USAR School, will perform this training "in lieu of" the annual unit training (summer camp) requirement with their unit.

The program will consist of approximately eight weeks of instruction at Army teaching hospitals, which will be devoted to military medicine and other military instruction, and the remaining time will be divided into two equal periods, one embracing internal medicine and its subspecialties, the other surgery and its subspecialties. A preventive medicine program will also be available and will include one week of general orientation in military organizaations, its functions and procedures, followed by detailed observation and assistance in a comprehensive preventive medicine program. Research clerkships are also available in a limited number for selected individuals at Walter Reed Army Institute of Research.

The program commences on July 1 each year and is of 45-60 days duration. A student selected for a clerkship between his sophomore-junior year is not eligible to apply for the clerkship between his junior-senior year.

Senior Medical Student Program

Selected senior medical students will be commissioned as second lieutenants, Medical Service Corps, United States Army Reserve, and will be permitted to continue their studies in their respective schools as officers on active duty with full pay and allowances until they complete their academic requirements for the degree of doctor of medicine. Upon completion of their medical education, selected students will be required to accept appointments in the grade of first lieutenant, Medical Corps, U. S. Army Reserve; they must agree to participate in the National Intern Matching Program, Incorporated, and serve on active duty for three years immediately following their civilian or military internship. This includes time obligated under the Universal Military Training and Service Act, if applicable. Participants who are not matched for an Army internship will be released from active duty for one year to allow them to complete a civilian internship, and they will then be recalled to active duty for three years at the end of the 12-month period.

Military Intern Program

Selected graduates of approved medical schools will be commissioned as first lieutenants, Medical Corps, U. S. Army Reserve, and will be ordered to active duty for the purpose of completing a 12-month internship in a military hospital. Individuals participating in the program will not incur obligatory service; however, those individuals who will be liable for military service under the provision of any law will be required to serve that obligation immediately upon completion of their internships. Military interns will be encouraged to apply for Regular Army and residency training.

Applicants must agree to participate in the official cooperative plan of internship appointments for first-year internships as conducted by the National Intern Matching Program, Incorporated.

Military Resident Program

The Military Resident Training Program is established for the purpose of providing the number of specialists required to meet the needs of the Army for career Medical Corps officers. Residencies are sponsored in both military and civilian hospitals.

Officers of the Regular Army Medical Corps and individuals who meet the appointment criteria for the Regular Army are eligible to compete for residency training. Although appointment in the Regular Army is not a requirement for appointment as a resident, the purpose of the program is to provide the Army with sufficient career personnel having the required specialty training. Accordingly, applicants will be considered on the following priority basis: (1) Regular Army Medical Corps officers, (2) Reserve Medical Corps officers on active duty, including interns who are concurrently applying for Regular Army appointment, (3) civilian physicians, including interns, who apply for Regular Army appointment, and (4) all other applicants.

Inasmuch as the number of applications received for participation in the Army residency program far exceeds the number of appointments available, consideration should be given to seeking a Regular Army commission in order to establish a priority for consideration for the residency program. Appointment for the program ordinarily will not be made more than two years in advance, and applications for Regular Army in connection with residency training will not be considered for appointment in a grade higher than captain. Individuals selected for training who have not completed the appropriate Army Medical Service orientation course, or an equivalent period of active duty as a medical officer, as determined by the surgeon general in each case, will be required to undergo such training prior to entering residencies. Selections will be made in November of each year. Appointments to fill remaining vacancies will be made from applications as received. Training in most specialties commences approximately every six months.

Individuals placed in residencies in Army hospitals will be required to serve one year on a duty status for each year of training received.

In the event spaces in the specialty requested are not available in Army hospitals on one of the next two or three starting dates after approval of an application, an opportunity will be offered to applicants approved for Regular Army to obtain residency training in a civilian hospital approved by the Council on Medical Education and Hospitals of the American Medical Association. Individuals participating in the program in civilian hospitals under this policy are required to serve on active duty for two years for the first year of training received and one year for each subsequent year.

Navy

THE ENSIGN 1915 USNR PROGRAM

After passage of the Selective Service Act of 1940, many medical students who were obligated for military service by the Act indicated their desire to affiliate with the Naval Reserve in order to assure that their period of active duty would be with the Navy's Medical Department. To make this possible and to provide deferment from active duty until graduation, the Ensign, Probationary (Medical) Program was established before the onset of World War II. The first appointments late in 1941 were limited to third-and-fourth-year medical students attending class "A" (approved) medical schools. Within a few months, however, the program was expanded to include first-year and second-year medical students, and it has since come to be known as the Ensign 1915 Program.

The number "1915" is a designator used to identify officers within the Department of the Navy by a code system. The first two digits, 19, indicate that the officer is under instruction in a civilian school; the last two digits, 15, indicate an officer of the Naval Reserve.

The qualifications for appointment as Ensign, 1915, are as follows:

A. Sex: Men and Women

B. Age

(1) Candidates with no prior military service should be at least 19 and of such age that upon expected date of graduation, they will be under 33. The maximum age limit with prior active military service may be adjusted on a month-for-month basis, depending upon the number of months of active military service performed, but in no case to exceed 36 months. Applications cannot be accepted from any person who will have passed his or her 36th birthday when he or she becomes eligible for superseding appointment in the Medical Corps, U. S. Naval Reserve following graduation from medical school.

C. Educational

(1) Should be within 120 days of completion of all academic work required for enrollment in medical school.

(2) Should be in attendance or have been accepted for and be within six months or less of the date of the next entering class at one of the American or certain of the Canadian medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Associa-

tion, including approved schools of the basic medical sciences in the United States and Canada. Applications cannot be accepted from students who will attend a medical school in a foreign country other than Canada.

(3) Should NOT have commenced the final year of medical school.

D. Professional

(1) Applicants are required to establish professional fitness and aptitude for the Naval Service through interviews and a review of college and employment records.

E. Physical Standards

(1) Should be found physically qualified for appointment to commissioned status in accordance with established regulations.

The primary objectives of this program are to provide (1) an opportunity for qualified medical students to affiliate with the Naval Reserve as commissioned officers while still in medical school; (2) assurance that these officers will be able to complete their medical studies and internship prior to fulfilling their obligation for active military duty; (3) assurance that, when they do enter the service, it will be within the Navy's Medical Department; and (4) a primary source of qualified candidates for the Naval Intern Program and for the Medical Corps of the Navy and Naval Reserve.

As an added incentive for membership in the Ensign, 1915 Program, there has been established a 30-60 day active duty research clerkship training program at naval research activities throughout the United States. This program provides orientation and indoctrination into medical research as well as on-the-job training for the undergraduate medical student during his vacation from medical school. Full pay and allowances are authorized for these selected officers while so serving on active duty. Medical students who are commissioned as Ensign, 1915 USNR, and who have successfully completed the first year of medical school are eligible to participate in this program. Research clerkships offer a detailed review of the specific research program being conducted at the training activity. A part of the training is spent in each research department, and the trainee serves as an assistant in actual laboratory research on a specific project under way at that time.

Also established are clinical clerkships at Naval teaching hospitals throughout the United States. Beginning July 1 of each year, this program offers quotas for selected medical students who have completed the second year of medical school, 30 to 60 days of active duty for training during vacation from medical school. Clinical clerkships are planned to provide indoctrination and orientation into naval medicine, rotation through the major professional services of a naval teaching hospital, and performance of on-the-job training duties commensurate with the individual's professional attainments.

Normally each year during the summer months a limited number of mature medical students holding commission as Ensign, 1915, are authorized to participate in NROTC-Midshipmen Cruises. Selections for this important training are made from students who have completed at least their second year of medical school with priority being given those who have completed their third year. Trainees receive an excellent indoctrination and orientation into the practices of naval medicine aboard ship under the supervision of experienced medical officers of the Regular Navy and Naval Reserve.

To assist the medical student financially, and to attract future doctors of medicine toward a career in the Navy Medical Corps, the Senior Medical Student Program was authorized by the Secretary of the Navy. To be eligible for participation, the individual student must be an Ensign, 1915 USNR, or agree to accept such an appointment if selected. Further, he must have completed his third year of medical school and be eligible for enrollment in the ensuing year. During attendance in medical school, these officers serve on active duty, receiving the full pay and allowances of their rank. In return for participation in this program, the individual serves one year plus the 24 months obligated by the Universal Military Training and Service Act, as amended.

Here are some important facts concerning the Senior Medical Student Program:

(1) This program is open to qualified students enrolled at medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Association. Students who have completed their second year of medical school may make application for this training at an Office of Naval Officer Procurement. Active duty commences and continues while in attendance during their senior academic year. To be eligible for participation, he must be an Ensign, 1915 U. S. Naval Reserve, or agree to accept such an appointment if selected. A board convened in the Bureau of Medicine and Surgery selects the candidates for participation in this program.

(2) Physical standards of this program are the same as those established for Regular Navy staff corps officers.

(3) Active duty orders are mailed to the student via the Professor of Naval Science or the District Commandant. Active duty commences upon receipt of such orders and completion of proper reporting endorsements.

(4) The student agrees, in writing, to accept a Regular Navy commission, and if a Regular Navy commission is not tendered, to accept an appointment in the Naval Reserve.

(5) In accepting an appointment in the Regular Navy or Naval Reserve, as a result of having active service in the Senior Medical Student Program as an Ensign, 1915, he is obligated to serve on active

duty and to retain the commission for a period of three years. This active service will commence upon completion of not more than 12 months of a civilian or Naval Internship. Providing that the student has 24 months obligated military service to perform, this active duty affords a splendid opportunity to discharge the military obligation and serve an additional year in return for the benefits received in the Senior Medical Student Program. With no obligated military service to perform, upon enrollment in the Senior Medical Student Program, the student obligates himself to serve for the same period of three years.

(6) As a medical student, he receives the full pay allowances of an Ensign, 1915, while so enrolled on active duty. Pay and allowances are based on longevity as follows:

(a) Less than two years and no dependents, he receives $338.58 per month; with dependents (a member of his family or household dependent upon him for financial support) he receives $355.68 per month.

(b) Over two but less than three years and no dependents, he receives $366.28 per month; with dependents, he receives $384.38 per month.

(c) Over three and no dependents, he receives $429.28 per month; with dependents he receives $447.38 per month.

(7) In addition to the pay and allowances, the student is credited with 2½ days of annual leave for each 30 days of active duty served.

(8) The wearing of the Naval uniform is permitted only when authorized by appropriate naval authority.

(9) Timing is very important. An average of four months is required to completely process each application. Feb. 1 each year is the absolute deadline that completed applications must be forwarded to the Bureau of Naval Personnel, Navy Department, Washington, D. C. This is necessary so that sufficient time is given to the board in the Bureau of Medicine and Surgery to pass on the professional qualifications and the board in the Bureau of Naval Personnel to pass on the over-all qualifications of each applicant. Those selected are required to meet the moral, mental, and physical standards of Navy acceptance. All applicants will be notified by individual letter of their acceptance or rejection not later than the first week in May.

NAVAL INTERNSHIPS

Naval internships are 12 months in duration, are rotating in type, and conform in all respects with the requirements of the Council on Medical Education and Hospitals of the American Medical Association. These compare most favorably with the best civilian internships and each year the number of applicants considerably exceeds the number of available naval internships. Internships are offered at the U. S. Naval Hospitals located at Camp Pendleton, Calif.; Oakland, Calif.; San Diego, Calif.; Jacksonville, Fla.; Pensacola, Fla.; Great Lakes, Ill.; Bethesda, Md.; Chelsea, Mass.; St. Albans, N. Y.; Philadelphia; Newport, R. I.; Charleston, S. C.; Portsmouth, Va.; and Bremerton, Wash.

All naval interns are selected and matched to the Navy by the National Intern Matching Program, Incorporated. It is not necessary for the medical student to be a participant in the Ensign 1915 USNR Program in order to apply and be accepted for a naval internship. On the other hand, if the Ensign 1915 USNR candidate does not desire a naval internship, he should list only the civilian hospitals in the order of his preference, and in this way he will not be competing with those who desire a naval internship and who request to be so matched. The Ensign 1915 candidate who is matched to a civilian internship will be placed on inactive duty during the period of his internship, following completion of which he will be called to active duty in compliance with his previous service agreement.

The basic requirements for a naval internship include the following: (1) be a graduate or potential graduate of a medical school approved by the American Medical Association; (2) be a citizen of the United States; (3) be registered with and his name appear in the Official Directory of Students published by the National Intern Matching Program, Inc.; and (4) meet the prescribed physical standards for a commission in the U. S. Naval Reserve.

In order to become eligible for consideration for a naval internship, candidates must first make application for a commission in the Naval Medical Corps. This can be accomplished by visiting or writing to the nearest Office of Naval Officer Procurement or the nearest U. S. Naval Hospital in the continental United States. In applying for a naval internship it is recommended that five (5) naval hospitals be listed in the order of preference. Generally assignments are made from among the first three listed. The candidate applies, as far as the matching is concerned, directly to the Navy and not to the specific hospital. If matched to the Navy every effort is made to place the candidate in his first choice, but if this is not possible he will be assigned to another hospital of his choice. In the matching program the student is matched to the service and not to a particular hospital within it.

Applications for commission in the Naval Medical Corps for intern training are accepted between Sept. 1 and Dec. 1 each year. That portion of the application pertaining to internship is accepted between Oct. 1 and Dec. 1. Early submission of applications is strongly recommended.

Any additional information may be obtained from the Chief, Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D. C.

NAVAL RESIDENCY TRAINING PROGRAMS

Eight U. S. naval hospitals are now approved for residency training in the various clinical specialties of medicine and surgery by the Council on Medical Education and Hospitals of the American Medical Association and by the respective American Specialty Boards. These naval hospitals are located at Chelsea, Mass.; St. Albans, N. Y.; Philadelphia; Bethesda, Md.; Portsmouth, Va.; Great Lakes, Ill.; Oakland, Calif.; and San Diego, Calif. Residency training for medical officers is also actively sponsored by the U. S. Navy in selected outstanding civilian hospitals, schools, and medical centers of the United States in those few specialties wherein the Navy does not operate formalized training programs. U. S. Naval Hospital residency training activities embrace the specialties of allergy, anesthesiology, cardiovascular disease, dermatology and syphilology, general practice, internal medicine, neurology, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, pediatrics, psychiatry, radiology, surgery, thoracic surgery, and urology. Formally approved training in civilian institutions is conducted in plastic surgery, neurological surgery, preventive medicine and public health, and in children's orthopedic surgery.

Medical officers eligible for assignment to duty as a resident are Regular Navy officers and those Reserve medical officers who have completed their active service obligations under the Universal Military Training and Service Act, as amended. Requests for residency training duty should be forwarded to the Chief of the Bureau of Medicine and Surgery, Navy Department, Washington 25, D. C. All such requests are acted upon by the Bureau Advisory Board on professional training matters. This board makes recommendations in accordance with the merits of each case, taking into consideration the professional experience, background, and aptitude of the candidate and the needs of the service in the particular specialty in which training is desired. One year of obligated service is required for each year of training received in a Naval hospital. Two years of obligated service are required for the first year of training received in civilian institutions and one year of obligated service for each successive year so spent.

It is the policy of the Bureau of Medicine and Surgery to continue a resident in training until formal requirements, leading to eligibility to undergo examination by an American Specialty Board, have been met. This procedure will be strictly adhered to in every case where the needs of the service permit, barring national emergencies, provided that such an arrangement remains mutually agreeable and satisfactory aptitude and progress as a resident are demonstrated. The highest priority in the assignment of naval medical officers to residency training is given those who have completed or are about to complete a normal tour of active duty with an operational unit of the U. S. Navy at sea or on foreign shore stations.

OTHER GRADUATE TRAINING FOR NAVAL MEDICAL OFFICERS, INCLUDING THE MILITARY MEDICAL SPECIALTIES

Aviation Medicine.—The School of Aviation Medicine at Pensacola, Fla., convenes four classes annually of approximately 30 students, for didactic instruction in aviation medicine and actual instruction in flight and ground school. Each class is of about six months duration. Upon completion of this course of instruction they are designated naval flight surgeons and assigned to a two-year period of operational duty. Additionally, the School of Aviation Medicine is approved for residency training in aviation medicine. This training may be requested after completion of the two year operational duty assignment and consists of one year of public health at a civilian institution and two years of residency training in aviation medicine at the school in Pensacola. They are then considered board eligible for certification in aviation medicine. Further opportunities are available in several large naval laboratories for work in research related to aviation medicine. The laboratories are located at Johnsville, Pa.; Philadelphia; and the School of Aviation Medicine, Pensacola, Fla. A medical officer interested in the aeronautical aspects would do well to consider this advanced training.

Submarine Medicine.—This military medical specialty supports all phases of underwater operations in the Navy. Training in this specialty is particularly applicable to those having an interest in occupational or preventive medicine and research in physiology. The basic six months course of training includes lectures, demonstrations, laboratory work, practical experience, and cruises in submarines, rescue vessels, and tenders as available. The majority of the course is given at the Submarine School and Medical Research Laboratory at the Submarine Base, New London, Conn. Eight weeks of the six months period is spent at the U. S. Naval Deep Sea Diving School, Naval Gun Factory, Washington, D. C., where the student learns about diving by making dives and about the physiological problems involved through classroom and laboratory periods.

Upon completion of a tour of duty with an operational unit the medical officer may apply for postgraduate training in various fields. He may prepare himself for later certification in occupational medicine by attending the academic year at the University of Rochester and later service in nuclear powered submarines or surface vessels. He may prepare for certification in preventive medicine by attending one of the public health schools and subsequent field duty ashore and afloat. He may prepare himself for a career in research by a postgraduate year at the University of Pennsylvania

College of Medicine followed by duty at naval laboratories and with operational units. Clinical medical specialty training in all fields is available and having served with operational units is an additional credit to one's application.

Research Program.—The Navy offers 60 Navy medical officer billets for military medical research careers. These opportunities embrace basic medical research in aviation medicine, submarine medicine, clinical specialties, amphibious and field medicine, tropical and exotic diseases and in the areas of the medical problems of nuclear, biological, and chemical warfare defense. These 60 billets are distributed among 15 in-service laboratories, strategically located throughout the world, and represent the program indicated above.

Amphibious and Marine Corps Field Medicine.—Recognized as an important military operational medical specialty, this training is conducted at Camp Lejeune, N. C., Camp Pendleton, Calif., and the Marine Corps Educational Center, Senior School, Quantico, Va. This specialty offers valuable training in the methods of sorting (triage), management, and evacuation of mass casualties, research and development of field medical equipment, field sanitation methodology and practices, medical logistic support, large scale medical planning, and efficient patient care in field combat.

Nuclear Medicine.—Graduate courses for medical officers are conducted at several U. S. Naval Hospitals, in affiliation with civilian institutions. Additional graduate courses in radiobiology are sponsored by the Navy for medical officers at Reed College, Portland, Ore., and the University of Rochester, Rochester, N. Y., to meet present and future needs of the Navy for personnel trained in the fields of nuclear propulsion, radiological safety and special weapons effects. Formal long courses for radiology and other residents are conducted in the clinical use of radioisotopes at the U. S. Naval Medical School, National Naval Medical Center, Bethesda, Md. This latter course is approved by the Atomic Energy Commission and is designed to fulfill the needs of those who wish to appear for future examination for certification by the American Board of Radiology, as well as those residents in other specialties who may need to acquire a better understanding of the clinical utilization of radioisotopes in diagnostic and therapeutic procedures.

Air Force

The Air Force is presently sponsoring training programs for senior medical students, as well as internships and residencies in both civilian and military hospitals. Applicants must be United States citizens, be morally, physically, and educationally qualified, and must not be nor have been conscientious objectors. Eligibility varies with each program according to the applicant's age.

THE SENIOR MEDICAL STUDENT PROGRAM

The Senior Medical Student Program offered by the Air Force is available to selected Junior Medical students. The application period for this program is Nov. 1 to March 1 of the junior year. Those selected are commissioned as second lieutenants and are sponsored from the date of matriculation to the date of graduation. Upon graduation they must agree to accept reappointment as first lieutenants and apply for either a military or a civilian-sponsored internship. Those not selected for intern training are released from active duty for one year to intern under private contract. Selected students incur a three-year obligation for sponsorship of the senior year. No additional obligation is incurred if they are selected for a sponsored internship.

AIR FORCE SPONSORED INTERNSHIPS, CIVILIAN AND MILITARY

The Air Force Intern Training Program, begun in 1950, is designed as a Regular Officer procurement program. For the year beginning July 1, 1959, the Air Force plans to sponsor 90 interns in military hospitals, selected through the National Intern Matching Program. The Air Force will also sponsor 80 interns in approved civilian hospitals. To be accepted, applicants must meet general eligibility requirements stated above, must not be more than 32 years of age, and must be graduates of medical schools acceptable to the Surgeon General.

Selection for civilian internships is made periodically by the Office of the Surgeon General on the basis of scholastic standing, physical fitness, and military aptitude and inclination. Applications for sponsored civilian intern training beginning July 1 are closed as of April 1 each year; closing date for applications for training beginning on "off-term" dates is announced by letter annually. For military internships, applications must be submitted not later than Dec. 1. Those selected are appointed effective the date of graduation from medical school as first lieutenant, Air Force Reserve (Medical). Military interns incur a minimum period of obligated service of 24 months and civilian interns, 36 months, regardless of their Selective Service classification. However, their military service obligation under the Universal Military Training and Service Act, as amended, will be discharged concurrently with this service.

Civilian interns are assigned to the hospital at which they have obtained an approved internship. Since the program is designed to cover the normal one-year internships, students who have accepted appointments to internships longer than 12 months are not favorably considered for this program. (They may not accept any remuneration from the hospital.)

Military interns are not assured assignment in any specific military hospital, but almost all are assigned according to their first, second, or third choice. Military internships are of the general rotating type so that applicants gain appropriate experience in various fields of medicine. Training is directed by military and civilian physicians and includes a wide range of clinical material, utilizing modern medical, surgical, and radiological facilities. It provides for one year of formal training in accordance with the requirements of the Council on Medical Education and Hospitals of the American Medical Association and is followed by two years of general medical duty in Air Force installations.

RESIDENCY TRAINING PROGRAM

The Air Force Residency Training Program is normally limited to members of the Regular Air Force and is conducted in both military and civilian hospitals (including nonmilitary government hospitals). For the year beginning July 1, 1959, the Air Force program provides for a maximum of 425 residents, 130 in military hospitals and 295 in civilian hospitals. Approximately 110 first-year residency training spaces are available. The spaces are about equally divided between military and civilian hospitals.

Physicians who enter this program are expected to remain in training until they have completed the minimum formal training requirements of the specialty boards. Applications for residency training and a regular commission may be submitted simultaneously and may be submitted at any time after completion of three months of internship. For each year of sponsored training in a military hospital, the period of obligated service incurred is one year; in civilian hospitals, the obligation is two years for the first year of training and one year for each additional year.

Residency training is available on a competitive basis in all recognized medical specialties according to the needs of the Air Force. The requirements are greater, however, for additional officers trained in general practice, pathology, otolaryngology, psychiatry, neurology, and obstetrics and gynecology. Training in the following specialties is available at the USAF Hospital, Lackland Air Force Base, San Antonio, Texas: anesthesiology, general surgery, internal medicine, ophthalmology, orthopedic surgery, pathology, pediatrics, and radiology. Applications for a Regular Air Force Commission and residency training to begin on July 1 should reach Headquarters USAF not later than Nov. 1. In any event, applications should be submitted not later than eight months prior to the beginning date of residency training.

The Aviation Medicine Specialty Training Program leading to board certification in Aviation Medicine is a comprehensive program of five years' duration. Applicants must be graduates of the Primary Course of Aviation Medicine and have had a minimum of nine months practice as an Aviation Medical Examiner. Applicants must be officers of the Regular Air Force, physically and professionally qualified, and be no more than 34 years of age when the class convenes. Applications must arrive at Headquarters USAF not later than Dec. 1 for entrance into program beginning the following September.

MEDICAL EDUCATION FOR NATIONAL DEFENSE

The following information on the status of Medical Education for National Defense, current to July 1, 1958, was submitted by the office of the national coordinator of the program.

The Medical Education for National Defense (MEND) Program is presently active in 45 of the American colleges of medicine, and 10 additional schools are to be selected for affiliation effective Jan. 1, 1959. Requests for MEND-affiliation have been considerably in excess of the program's ability to expand, and a waiting list for affiliation is maintained.

The 45 schools presently taking part in the program are Albert Einstein, Baylor, Bowman Gray, Buffalo, California (San Francisco), University of California at Los Angeles, Colorado, Columbia, Cornell, Creighton, Duke, Emory, Georgetown, Howard, Illinois, Iowa, Kansas, Louisiana State, Louisville, Maryland, College of Medical Evangelists, Miami, Michigan, Mississippi, New York University, North Carolina, Northwestern, Ohio State, Oklahoma, Pennsylvania, Pittsburgh, Rochester, Stritch, Temple, Texas (Galveston), Tufts, Tulane, Vanderbilt, Vermont, Medical College of Virginia, University of Virginia, Washington University (St. Louis), University of Washington (Seattle), Western Reserve and Wisconsin.

MEND is a function of the MEND Program subcommittee of the Association of American Medical Colleges; it is endorsed by its parent organization, by the American Medical Association Council on Medical Education and Hospitals and the Council on National Defense, and by medical officials of the Department of Defense, Army, Navy, Air Force, Public Health Service, and the Office of Defense and Civilian Mobilization. It has received the approval and cooperation of a wide variety of federal and private medical and educational activities.

The purpose of the program is to encourage the teaching of principles of military and disaster medicine by regular faculty members of our medical colleges. Nothing is mandatory; each faculty is free to accept or reject any part of the program not consistent with the local philosophy of medical education. All emphasis is on medical rather than military topics. It is hoped that the problem of national preparedness in medical education can be solved by interested faculty members on a local basis and under local control rather than through such methods as the establishment of a federal medical school or through direct federal intervention in curricular content.

Annually, MEND sponsors a series of symposia, with these programs being conducted by federal medical personnel for representatives of nongovernmental medical education. During 1957-1958, two programs were conducted: "Management of Mass Casualties" at the Walter Reed Army Institute of Research in Washington, D. C., and "Medical Aspects of Highway Safety" at Ann Arbor, Michigan. The former program attracted 64 participants, and the latter, presented by the Public Health Service, was attended by 102. Each year MEND also conducts an Orientation Tour for deans and coordinators of newly-MEND-affiliated schools, designed to introduce them to current problems and trends in the federal services.

Activities at the 45 colleges have included special lectures, conferences, and demonstrations in the following subjects: surgery of trauma, wound ballistics, war wounds, radiobiology, defense measures to chemical and biological warfare, aviation medicine, management of mass casualties, civil defense responsibilities of the medical profession, infectious disease problems in disaster situations, and others.

The national coordinator of MEND has an office at the Bureau of Medicine and Surgery, Department of the Navy, Potomac Annex, Washington 25, D. C.

AREAS ALLIED TO MEDICINE

SCHOOLS FOR MEDICAL RECORD LIBRARIANS

The Council has worked closely with the American Association of Medical Record Librarians since 1942 in the development of criteria for and evaluation of educational programs in medical record library science. Initial and continued approvals of schools are considered by the Council on the basis of the recommendations of the Committee on Education and Registration of the American Association of Medical Record Librarians, which has an able education director who makes periodic survey-visits to schools. Significant studies to further advance training in the field are being carried out effectively by the American Association of Medical Record Librarians.

Revision of the curriculum currently recommended by the Council and the American Association of Medical Record Librarians is under active consideration. Revisions will be gradually implemented and based upon studies which will not be completed for several years. The following is abstracted from the statement of the American Association of Medical Record Librarians on one of the studies, "The Functions and Education of Medical Record Personnel" carried out by the University of Pittsburgh:

To implement the recommendations of the study, the American Association of Medical Record Librarians proposes to utilize its education consultant, education director and Education and Registration Committee to develop a detailed sample curriculum along the lines proposed to submit to academic institutions interested in establishing medical record science programs. It is suggested that for purposes of evaluation, this method of education be tried in a limited number of colleges and universities.

The proposed curriculum, however, varies radically in its approach to teaching medical record personnel from that currently being used in existing schools. To familiarize directors and instructors with all types of teaching methods, and, also, to develop cooperatively more and better teaching materials, the Association plans to expand its present program of workshops. It proposes, also, to recommend revision of the Essentials for an Acceptable School for Medical Record Librarians (to the Council on Medical Education and Hospitals). As they stand, these Essentials not only preclude the curriculum recommended by this study, but they also conflict with the academic requirements of those colleges and universities which at the present time are affiliated with medical record librarian schools.

The Association appreciates that the proposals so far discussed are long range in nature and cannot immediately meet the acute shortage of trained medical record personnel. Accordingly, it proposes an accelerated in-service training program for medical record personnel which will improve the skill of untrained workers but will in no way produce professional medical record librarians.

As of June 30, 1958, there were 30 approved schools. Student enrollment increased in 1957 to 161 students in the senior class of degree programs and in certificate programs, which represents an 11% increase over 1956. There was a training capacity for 212 students in these programs, but three schools had no students enrolled during 1957. Accordingly, the occupancy rate was 40% for the senior class of 9 degree programs with senior students in 1957 and 85% in the 19 active certificate programs. Since students were separately enrolled in both programs offered by one school, students were enrolled in 28 programs offered by 27 schools. The number of graduates for six degree programs was 34. In addition, there were 105 graduates from 20 certificate programs or a total of 139 graduates from 25 schools in 1957.

Approved schools offer curricula which include theoretical instruction and practical training in hospitals. When the hospital training is sequentially and properly integrated with collegiate studies, a degree is available after four years of study. Among the 10 schools offering degree programs, 7 admit qualified high school graduates, and 3 schools offer a curriculum of 12 months' duration with admission requirements of three years of preparatory collegiate preparation. In the 21 schools offering certificate programs of one year's duration, 15 require two years of college prior to admission. All but two of these 17 schools will also admit graduates from an accredited school of professional nursing of at least three years' duration. A college degree is required for admission into four certificate programs. Lists of approved schools are available from the Council. Applicants should write directly to the Medical Record Librarian-Director of the School.

Schools conducting degree programs usually begin in June, and the majority of certificate programs admit students in September. Tuition ranges from $66 to several hundreds of dollars per year, and one school requires none. Application for approval by a hospital or university should be made to the Council on Medical Education and Hospitals of the American Medical Association.

SCHOOLS FOR MEDICAL RECORD TECHNICIANS

Schools for medical record technicians are conducted to train the medical record technician who, working under the supervision of a qualified medical record librarian or a medical record committee, performs the technical tasks associated with the maintenance and custody of medical records.

As in the case of schools for medical record librarians, the Council has developed educational criteria for and evaluates schools in close collaboration with the American Association of Medical Record Librarians.

The training of medical record technicians should be conducted in acceptable general hospitals having a minimum of 4,000 annual admissions. These admissions should include an adequate distribution of patients in the various clinical services commonly found in general hospitals. Candidates for admission to an approved school should be proficient in typing and preferably also in shorthand. They should have completed the requirements for high school graduation or should have passed a college entrance examination for admission to an accredited college or university. The minimum length of training is nine months and should include theoretical instruction in anatomy, medical terminology, and medical records, with additional practical training in admitting and discharge procedures, indexing, preparation of reports, and other activities associated with the medical record department.

There are 11 hospitals approved by the Council for training medical record technicians. These schools reported a training capacity for 73 students with an enrollment of 58 students and 37 graduates in 1957. Data for 1956 are 10 schools with a training capacity for 69 students, an enrollment of 55 and 37 graduates. Qualified high school graduates are accepted for courses of from 9 to 12 months' duration.

Hospitals should apply to the Council on Medical Education and Hospitals for approval. Special forms will be supplied for this purpose, and, when the required information has been received, the proposed training program will be reviewed in collaboration with the Committee on Education and Registration of the American Association of Medical Record Librarians. The institutions applying for Council approval will, in all instances, receive full information and every possible assistance in the planning and development of training programs in accordance with present standards. There continues to be an acute shortage of qualified medical record librarians and medical record technicians. Excellent opportunities exist for graduating students. Inquiries on career opportunities, registration, and accreditation of qualified medical record personnel should be addressed to the American Association of Medical Record Librarians, 510 N. Dearborn St., Chicago 10.

SCHOOLS FOR MEDICAL TECHNOLOGISTS

In its continuing efforts to assist hospitals in the development of training programs for medical technologists, the Council cooperates closely with the American Society of Clinical Pathologists, the Board of Schools of Medical Technology, the Board of Registry of the Society, and the American Society of Medical Technologists. The board of schools was established by the society in 1949 to serve as the major advisory body to the Council in all matters relating to standards and the evaluation of educational programs. Revisions of the standards occurred in 1941, 1943, 1947, 1949, 1953, and June, 1958. The significant revision is that, effective Jan. 1, 1962, entrance requirements will be increased from two to three years of pretechnical collegiate education. No major change has been made in the 12 months' technical curriculum in the hospital. It is expected that the third year of college will provide emphasis on general education yet also afford, in appropriate balance, selected courses to broaden the students' science background. Schools not currently affiliated with colleges and universities are encouraged to consider affiliation or affiliations whereby a consecutive educational sequence of three years of college and one year of hospital training will lead to a baccalaureate degree. While such affiliation is not required, it is encouraged on the basis of the inherent educational benefits to students and faculties and the favorable experience of currently affiliated hospital schools.

As of June 30, 1958, there were 681 approved schools, or an increase of almost 4% over the 656 schools approved in 1957. Enrollment increased 6% to 3,099 students in 1957 and the number of graduates was 2,285, which represents a 7% increase over 1956. With a student capacity of 5,186, the occupancy rate in 1957 was 60%. The increases in student enrollment and number of graduates reflect the effective recruitment program of the National Committee for Careers in Medical Technology sponsored by the College of American Pathologists, American Society of Clinical Pathologists, and American Society of Medical Technologists and the concerted recruitment activities of the faculties of approved colleges and universities.

Eighty per cent, or 545 training programs, base admission on two years of college; 90 (13%) require three years of preclinical college education; and 46, or 7%, require a baccalaureate degree for admission.

The number of hospital schools with college or university affiliations continues to increase. In 1957, a total of 490 hospital schools (72%) had college or university affiliations. Such affiliations as noted above are strongly encouraged since they stimulate the development of well-organized training programs suitably integrated with the college curriculum and also serve as a continuing source of students. If properly integrated, a degree is available upon completion of three years of college education followed by one year of hospital training in 452 (66%) of the 681 approved schools. Active liaison between the hospital and the affiliated college is strongly recommended through regularly scheduled meetings of an advisory or coordinating committee comprised of representatives from each faculty.

The minimum duration of the hospital course acceptable for approval is 12 months. Ninety per cent, or 616 schools, offer a course of 12 months' duration. The remaining 10% of the programs vary from 12½ to 36 months in length. Tuition is required by 158 (23%) and a minimal breakage fee by 67, or less than 10%, of the schools. Students receive a stipend in 370 (54%). All states, the District of Columbia, the Canal Zone, Hawaii, and Puerto Rico have approved schools. Interested high school students should apply to accredited colleges and universities of their choice; those students in college or with collegiate backgrounds should apply to the pathologist-director of the laboratory school of their choice. Lists of approved schools of medical technology, which indicate those schools that have college affiliations, are available from the Council.

Application for approval of a school for the training of medical technologists should be made to the Council on Medical Education and Hospitals of the American Medical Association. Forms will be supplied for this purpose on request and should be completed by the director of the laboratory requesting this approval. Inquiries regarding the registration of qualified medical technologists should be addressed to the Board of Registry of Medical Technologists, 611 W. Howard St., Post Office Box 44, Muncie, Ind.

SCHOOLS FOR OCCUPATIONAL THERAPISTS

Through a cooperative liaison which began in 1933 on the request of the American Occupational Therapy Association, the Council has developed standards for the education of occupational therapists. These were initially adopted by the House of Delegates in 1935, and subsequent revisions have been approved in 1938 and 1949. Recommendations for periodic revisions of standards and on initial and continued approvals of curricula are submitted to the Council by two advisory groups, the Advisory Committee on Occupational Therapy Education of the Council on Medical Education and Hospitals and the Council on Education of the American Occupational Therapy Association. The recently appointed advisory committee consists of nine physician members nominated by national organizations in the fields of chest diseases, general surgery, internal medicine, neurology, orthopedic surgery, pediatrics, physical medicine and rehabilitation, psychiatry, and medical education. In addition, there are three occupational therapist members nominated by the American Occupational Therapy Association, and its Director of Education serves as a consultant. Surveys of schools are conducted by joint physician-therapist teams and submitted to the advisory groups which formulate recommendations for final action by the Council. Conferences and basic studies are being carried out by the American Occupational Therapy Association, with the assistance of other organizations, to further advance educational opportunities in the field.

As of June 30, 1958, there were 29 approved schools, 1 of which was on a stand-by basis during 1957. Statistics for total degree and certificate student enrollment and graduates for the academic years 1956, and 1957 and 1958 based upon data submitted to the American Occupational Therapy Association are shown in table 57.

Training for an occupational therapist includes a good general collegiate education coordinated with theoretical and technical instruction in occupational therapy and supervised clinical practice in hospitals. Certificate and/or degree recognition are available, and those so recognized have equal professional status. Programs leading to a baccalaureate degree are generally of four years duration, and schools offering this curriculum accept qualified high school students and transfer students. Certificate programs are predominantly 18 months in duration and accept students with a baccalaureate degree. However, since universities have individual policies on transfer students, interested undergraduates are encouraged to contact schools of their choice early in their collegiate careers to determine admission requirements for the certificate and/or degree programs in a given school. Tuition in all teaching centers closely parallels college fees. Most courses begin in September or February. Lists of approved schools are available from the Council.

Table 57.—*American Occupational Therapy Association Statistics for Total Degree and Certificate Student Enrollment and Graduates for the Academic Years 1956-1958.*

Year	Total Student Enrollment	Graduates
1956	4,903	469
1957	4,532	490
1958	4,083	511

Application by schools for approval of an educational program in occupational therapy should be made to the Council on Medical Education and Hospitals of the American Medical Association. Forms will be supplied for this purpose on request. They should be completed by the administrator of the institution requesting approval. Inquiries regarding career opportunities in the field of occupational therapy and the registration of qualified therapists should be addressed to the American Occupational Therapy Association, 250 W. 57th St., New York 19.

SCHOOLS FOR PHYSICAL THERAPISTS

On the request of the American Physical Therapy Association, the Council developed standards that were adopted by the House of Delegates in 1936. The Council, in cooperation with its advisory groups, the Council on Physical Medicine and Rehabilitation of the American Medical Association and the American Physical Therapy Association, has periodically submitted revised standards to the House of Delegates, which were adopted in 1943, 1949, and 1955. In 1955, the Council on Physical Medicine and Rehabilitation became the Council on Medical Physics, with which there continues close liaison on matters pertaining to physical therapy but which no longer functions in an advisory capacity on physical therapy education. Applications of new schools are reviewed in collaboration with two groups, the Advisory Committee on Physical Therapy Education of the Council on Medical Education and Hospitals and the American Physical Therapy Association. The Advisory Committee on Physical Therapy Education consists of nine physician members who are nominated by national organizations representing the fields of physical medicine and rehabilitation, orthopedic surgery, psychiatry and neurology, internal medicine, pediatrics, general surgery, and medical education. In addition, there are three members who are physical therapists, two nominated by the American Physical Therapy Association and one nominated by the American Registry of Physical Therapists. The senior educational consultant of the American Physical Therapy Association attends meetings as a consultant. Surveys of new and existing schools are conducted by joint physician-therapist teams and recommendatory action submitted by the advisory groups to the Council for action. Active liaison which the medical directors, therapist educational administrators, and other members of the teaching faculties in approved schools is being implemented through more frequent periodic surveys.

Table 58.—*American Physical Therapy Association Statistics for Degree and Certificate Enrollment for the Academic Years 1956-1957*

Year and Class	Schools Reporting, No.	Senior (Degree) and Certificate Students Enrolled, No.	Graduates, Total No.
1956 Senior	25	800	701
1956 Certificate	28		
1957 Senior	14	798	750
1957 Certificate	30		

As of June 30, 1958, there were 37 approved schools. On the basis of data reported to the American Physical Therapy Association, fall enrollment statistics for the senior class of degree programs and for the certificate programs and the number of graduates for 1956 and 1957 are shown in table 58.

Certificate and/or degree recognitions in physical therapy are available, and those so recognized have equal professional status. Most schools offer both degree and certificate programs, and either or both recognitions are available, depending upon a student's preparatory collegiate education. Certificate programs are usually 12 months in duration. The courses are open to students with two or three years of college or those who have graduated from a nationally accredited school of professional nursing of at least three years' duration. The majority of degree programs are four years in length and admit qualified high school graduates and transfer students. Interested undergraduates are encouraged to contact the school of their choice early since admission and transfer requirements vary. Tuition varies in accord with university fees and the majority of courses begin in September and February. Lists of approved schools are available from the Council.

Application for approval should be made to the Council on Medical Education and Hospitals of the American Medical Association. Forms will be supplied for this purpose on request. They should be completed by the administrator of the institution requesting this approval. Inquiries regarding voluntary registration of qualified therapists should be addressed to the American Registry of Physical Therapists, 30 N. Michigan Ave., Chicago 2. Information on requirements for state registration or licensure is available from the Board of Examiners of the states concerned. Inquiries regarding careers in the field of physical therapy should be addressed to the American Physical Therapy Association, 1790 Broadway, New York 19.

SCHOOLS FOR X-RAY TECHNICIANS

The Council has been ably assisted by the American College of Radiology, the American Registry of X-ray Technicians, and the American Society of X-ray Technicians in revising criteria for training and evaluating educational programs in x-ray technology. These advisory groups participated in the most recent revision of the standards adopted by the House of Delegates in December, 1955. Particularly encouraged is progressive training in radiation therapy to afford students at least one month's practical experience intramurally or through affiliation.

Schools making application for approval are surveyed by state and regional councilors appointed by the American College of Radiology. Radiologists appointed by the College also periodically resurvey approved schools, and these radiologists are currently revisiting approved schools. Their tremendous and voluntary contribution of time and experience are a major asset in the program. All data are evaluated by the Committee on Technician Affairs of the American College of Radiology and recommendations submitted to the Council for final action.

As of June 30, 1958, there were 557 schools approved by the Council for training x-ray technicians, which represents an increase of almost 8% over the 517 approved in 1957. Enrollment for 1957 increased 901 or 28%, to a total of 4,113 students. The training capacity increased 22% in 1957 over 1956 to a total of 4,848. The number of graduates increased 7% to a total of 2,109 in 1957.

The minimum admission requirement is high school graduation. A total of 539 schools (97%) admit students directly out of high school, 13 schools (2%) require one year of college, 4 schools (1%) require two years of college, and one school accepts only registered nurses.

The length of training in 335 (60%) is 24 months, 12 months in 129, (24%), 18 months in 59 (10%) and varies from 13, 14, 15, 36, and 48 months in 5%. Five schools offer two courses of 12 or 24 months duration. Tuition is required by 193 (35%) and 73 pay students a stipend. Collegiate affiliations have been established by 181 (35%) of approved schools. Students should apply directly to the radiologist-director of an approved school. Lists of approved schools are available from the Council on request.

Applications for approval of schools of x-ray technology should be submitted to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Inquiries regarding registration of qualified x-ray technicians should be addressed to the American Registry of X-ray Technicians, Metropolitan Building, Minneapolis 1.

References

1. Bowers, J. Z., and Parkin, R. C.: Wisconsin Preceptor Program: Thirty-Year Experiment in Medical Education, J. M. Educ. **32:**610-12 (Sept.) 1957.

2. Page, H. A., and Anast, P. P.: Alumni Evaluation of Wisconsin Preceptoral Programs, J. M. Educ. **32:**613-617 (Sept.) 1957.

3. Dingle, J. H., and others: Approach to Evaluation of Medical Education at Western Reserve University, J. M. Educ. **33:**113-117 (Feb.) 1958.

4. Horowitz, M. J.; Brozgal, J. L.; and Eaton, J. W.: Observations of First-Year Students in Preceptoral Groups, J. M. Educ. **33:**118-131 (Feb.) 1958.

5. Merton, R. K.; Reader, G. G.; and Kendall, P. L.: Student-Physician: Introductory Studies in the Sociology of Medical Education, Boston, Harvard University Press, 1957, p. 360.

6. Moses, C.; Gregg, L. A.; and Danowski, T. S.: J. M. Educ. **33:**501-507 (June) 1958.

7. McKittrick, L. S.: Reason Underlying Conference on Medical Education and Licensure, J. A. M. A. **167:**21-23 (May 3) 1958.

8. Allman, D. B.: American Medicine: Its Responsibilities in Planning for Future Needs in Medical Education, J. A. M. A. **167:**23-26 (May 3) 1958.

9. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **159:**570 (Oct. 8) 1955.

10. Kirk, D.: Population Characteristics and Trends and Their Implications in Medical Education, J. A. M. A. **167:** 26-30 (May 3) 1958.

11. Parsons, T.: Some Trends of Change in American Society, J. A. M. A. **167:**31-36 (May 3) 1958.

12. Kestnbaum, M.: Changing Characteristics of Our Economy, J. A. M. A. **167:**36-40 (May 3) 1958.

13. Hussey, H. H.: Changing Dimensions of Medical Knowledge: Their Implications for Medical Education, Research, and Practice, J. A. M. A. **167:**40-47 (May 3) 1958.

14. Darley, W.: Undergraduate Medical Education and the Changing Status of Patients, J. A. M. A. **167:**182-186 (May 10) 1958.

15. Hamilton, T. S.: Problems in Specialty Training Created by Changing Status of Patients, J. A. M. A. **167:**187-192 (May 10) 1958.

16. Zintel, H. A.: Postgraduate Surgical Training and Changing Economic Status of Patients, J. A. M. A. **167:**211-214 (May 10) 1958.

17. Williams, R. H.: Future Training in Medicine and Medical Specialties, J. A. M. A. **167:**192-199 (May 10) 1958.

18. Lawson, R. B.: *Aspects of Pediatric Residency Training*, J. A. M. A. **167:**200-202 (May 10) 1958.

19. Barnes, A. C.: Problems in Training in Obstetrics and Gynecology Due to Changing Status of Patients, J. A. M. A. **167:**202-206 (May 10) 1958.

20. Burgess, A. M., and Leonard, J. C.: Community Hospital and Graduate Education Today, J. A. M. A. **167:**206-210 (May 10) 1958.

21. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **165:**1402-1403 (Nov. 16) 1957.

22. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **159:**570 (Oct. 8) 1955.

23. Carroll, A. J.: Study of Medical College Costs, Association of American Medical Colleges, 1958.

24. Knott, L. W.; Gooch, M.; and Hillard, H. E.: The Cost of Medical Education, J. M. Educ. **33:**429-444 (May) 1958.

25. Darley, W.: Preface to Study of Medical College Costs, Association of American Medical Colleges, 1958.

26. Graduate Medical Education, Report of Commission on Graduate Medical Education, University of Chicago Press, 1940.

27. Flexner, A.: Medical Education in Europe, Carnegie Foundation, New York, 1912, Introduction, pp. viii-ix.

28. Cain, A. S.: Survey of Postdoctoral Fellowships by National Academy of Sciences—National Research Council, Council on Medical Education and Hospitals, J. A. M. A. **165:**1963-1964 (Dec. 14) 1957.

29. Medical Education in the United States and Canada: Conclusions and Recommendations of Council on Medical Service Relating to Private Practice of Clinical Faculty Personnel, Council on Medical Education and Hospitals, J. A. M. A. **161:**1651-1653 (Aug. 25) 1956.

30. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **165:**1431-1437 (Nov. 16) 1957.

31. Gee, H.: Annual Study of Applicants, J. M. Educ., to be published.

32. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **165:**1423-1426 (Nov. 16) 1957.

33. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **158:**588-589 (Oct. 8) 1955.

34. Gee, H.: Personal communication, to be published.

35. Admission Requirements of American Medical Colleges (including Canada), Association of American Medical Colleges, 1955-1956, 1956-1957, 1957-1958, 1958-1959.

36. Admission Requirements of American Medical Colleges (including Canada), Association of American Medical Colleges, 1958-1959.

37. Open Doors, 1958, New York, Institute of International Education.

38. Medical Education in United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **161:**1661-1663 (Aug. 25) 1956.

39. Postgraduate Courses for Physicians, Council on Medical Education and Hospitals, J. A. M. A. **167:**1953-2009 (Aug. 16) 1958.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . AUSTIN SMITH, M.D.
Associate Editor . . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

◆

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

THE PURPOSE OF A MEDICAL SCHOOL

IN THEIR introductory statement Sheehan and Taylor [1] indicated that the training of the physician, the search for new knowledge, and the care of the sick are the inseparable threefold facets which constitute the mission of a medical school. It is only through long training in the scientific methods of investigation and by actual care of patients that medicine can be passed on to succeeding generations. Research, which is the background of progress in medicine, turns to the medical school for its investigators and to patients for its problems, with the future of medical care dependent on the production of a continuing supply of physicians and the potentialities of new discovery. "The purpose of a medical school . . . can only be achieved by endeavor in all three directions—medical education, research, and community care—and they must be carried on simultaneously, for they are wholly dependent upon each other, not only for inspiration but for their very means of success."

Every school has the duty and obligation to strive for excellence in each of its three functions to the extent of its individual potentials. There can be no question but that the quality of medical education and research determine the standard of medical care which the nation is to enjoy. It is also true that medical care will be only as good as the men and women who are responsible for it. Thus, in the overall chain of responsibility leading to the objective of preparing medical students, interns, residents, and graduate physicians to render the best possible medical care, the medical schools play key roles as guardians of the health of the community.

If this guardianship is to be fully effective it is essential that those responsible for the conduct of modern medical schools recognize the continuing challenge with which they are confronted. To make the role of the medical schools achieve maximum potential it is vitally important that the medical profession recognize and support the efforts of the schools to meet the challenges presented to them by these threefold areas of responsibility.

The past two generations have witnessed such rapid strides in medical knowledge that the very nature of medical practice and many phases of medical education have been altered. At the present time there is every reason to believe that the next two generations will witness even greater advances in knowledge and continuing dramatic changes in medical practice. Medical education will face challenges to test the ingenuity and imagination of its most outstanding leaders. Many diseases common three decades ago are rarely observed today, while others present increasingly frequent and provocative problems. Along with the changing panorama involved in prevention, diagnosis, and therapy there are also the tremendous challenges presented by changing social and economic characteristics and trends which hold significant implications for medical care and medical education. It is of great importance that these problems and challenges be as clearly defined as the changing scene permits and that they be objectively studied in proper perspective. Their solution should be continuously sought through the mutual efforts of all individuals and organizations concerned with medical education, research, and care. One of the major purposes of a medical school should be to endeavor to inculcate in its faculty and in the students who represent the physicians of the future an acceptance of the constancy of change and the challenge for constructive adventure which it affords if medical education and medical care as well as research are to effectively meet the needs of the changing scene.

THE FULL-TIME FACULTY DEFICIT

During the past several years the annual report on Medical Education in the United States and Canada has included an analysis of the budgeted, unfilled full-time faculty positions in medical schools in the United States. The report for last year indicated a total of 331 such vacancies for 1956-1957, an increase from 258 in 1954-1955 and from 251 in 1955-1956. Tables 16 and 17 in the text of this report present a departmental analysis of both new and old budgeted unfilled full-time faculty positions, which total 619 for 1957-1958. This increase of approximately 90% of such vacancies in the interval of a single year presents a problem of major concern to medical education. Its magnitude, unless the trend is reversed, has developed to the point where it may jeopardize certain aspects of medical education, research, and care in the period that lies ahead.

---

[1] Sheehan, D., and Taylor, H. C., Jr.: Introduction to Mission of Medical School, ed. 2, revised, New York, New York University Press, 1950.

Although some of the increase in budgeted, unfilled full-time faculty positions represents additional needs presented by newly developing institutions, this circumstance accounts for a relatively small number of the vacancies reported. In 1957-1958 all newly budgeted unfilled full-time positions totaled 196, of which 71 were in the basic medical sciences and 125 in the clinical areas. This represented a total increase of 48 over the 148 reported in 1956-1957 when there were 55 such vacancies in the basic medical sciences and 93 in the clinical departments. The major, and most alarming, aspect of the current report for 1957-1958 lies in the number of old (not newly created) budgeted, unfilled full-time faculty positions. In the basic medical sciences the number had increased to 168 for 1957-1958 as compared to 89 in 1956-1957. In the clinical departments there were 255 such unfilled positions in 1957-1958 compared to 94 in 1956-1957.

Those concerned with medical education are confronted with a challenge necessitating serious analysis, together with the development of the means of resolving this problem in the future. There is general indication of the need for increasing facilities for medical education which will reflect itself in the need for larger numbers of adequately qualified full-time faculty personnel in both basic medical science and clinical areas. Thus, medical education finds itself on the horns of a dilemma with the medical schools now in operation unable to fill the existing full-time faculty positions while at the same time advocating the development of new schools which will necessitate many additional full-time faculty personnel.

What has been responsible for this problem? Why are so many budgeted full-time faculty positions unfilled? What can be done to reverse the trend of the past few years and eventually to resolve the personnel problem it has created? These and many associated questions merit careful study and require definitive action. There are more people engaged in medical research today than ever before but the competition for qualified personnel in this area constantly increases. The tremendous expansion of research programs in such organizations as the Public Health Service (National Institutes of Health), the pharmaceutical industry, and other organizations have presented competitive opportunities for personnel in basic sciences. Economic competition in the form of laboratory activities or private practice undoubtedly continues to play a significant role. With due regard to these and other factors, the fact remains that the problem of obtaining and maintaining adequate full-time faculty personnel for those disciplines where such personnel are essential to the teaching and research activities of modern medical schools represents a constant and increasingly difficult challenge. Failure to meet it may seriously interfere with the ability of medical education to maintain and advance its standards as well as prevent the successful expansion and development of needed new facilities. The challenge is one that cannot be ignored.

BALANCES TO BE CONSIDERED IN INTERNATIONAL EDUCATIONAL EXCHANGE OF MEDICAL STUDENTS

In its presentation of the section of the annual report on medical education dealing with International Educational Exchange in Medicine, the Council on Medical Education and Hospitals has published two tables (47 and 49) which are worthy of careful thought. The data in these tables indicate that for every foreign student receiving his basic medical education in the United States, there are seven United States students undertaking medical studies outside of this country and Canada.

In all fields of higher education, the quality of the students and the educational program are of major significance in determining the level of educational objectives that can be achieved. Because of the close relationship between the product of medical education, the physician, and the health and welfare of the public, there must be a peculiar concern with these qualitative factors in medicine.

Admissions policies of medical schools in the United States generally make it difficult for any but unusually competent students from other countries to be accepted. The foreign student who gains a position in a United States medical school wins that place by successfully competing with United States students and, because of restrictions of admissions policies, most often he has competed with the more able United States students. Thus, the relatively few foreign students in United States medical schools in general represent a rather high quality of scholastic achievement and potential. Their academic achievement can usually be judged against a familiar yardstick since they commonly have had at least a part of their college preparatory studies in the United States.

Since World War II, in comparison with foreign students enrolled in United States medical schools, there has been an increasingly large number of United States students studying medicine abroad. In the years immediately after the war, the numbers of United States students seeking careers in medicine exceeded the available positions in our schools. During this period, there undoubtedly were many students who, although qualified for medical study by our usual standards, could satisfy their career plans only by gaining admission to medical schools in other countries. In the past six years, on a national basis, the number of qualified students desiring places in our medical schools has not been excessive to the number of places available.

In the face of this relative equilibrium between United States medical school positions and students interested in and competent for medical study, there continues to be a growing number of American citizens undertaking basic medical study abroad. Undoubtedly, a portion of these students are primarily motivated by a desire to join preparation in medicine with the opportunity for cultural enrichment afforded by foreign study. On the other hand, it seems likely that many of the American students enrolling in foreign medical schools do so because they have not been considered fully qualified for admission to medical schools in this country. Of the many inquiries received by the Council on Medical Education and Hospitals from students contemplating medical study outside the United States and Canada, it has commonly been evident that the inquirer has made earlier, unsuccessful attempts to enter medical schools in this country.

The stakes in the international exchange of students, when considered in their broadest implications, are of imposing significance. Medical exchange involves not only these broad political and cultural considerations but also the narrower, yet very important, consideration of the immediate and future impact of the exchange on health care. At the medical student level, there may be reason for concern that our side of the balance as the sending nation is maintained more by quantitative weight than the receiving side of the balance, which appears to be weighted more by qualitative factors.

FUNNEL CHEST

References to funnel chest in the literature are increasing because of a change in attitude toward indications for operative treatment and some controversy regarding the best type of operation. This apparently hereditary anomaly results from a failure of normal development of the anterior portion of the diaphragm. Earlier writers considered attempting surgical correction only in patients who showed evidence of cardiorespiratory embarrassment, but with modern advances in chest surgery the indications have been greatly liberalized. Although improvement of the appearance of the chest may not be very important in itself, Sutherland[1] called attention to the bad psychic effects in a child of having a deformity that is all too obvious in a gymnasium or natatorium. These children become shy, withdrawn, and depressed. The rapid improvement in personality after surgical correction is itself a sufficient justification of the procedure.

In addition to psychic symptoms funnel chest is associated with such postural disorders as an upper thoracic kyphosis, protuberant abdomen, and forward displacement of the neck and shoulders. In severe cases the patient cannot cough effectively and so becomes prone to chronic bronchitis and bronchiectasis. If not corrected the deformity slowly progresses throughout childhood, and the heart becomes displaced to the left. Functional murmurs and cardiac arrhythmia are commonly observed and the electrocardiogram shows right axis deviation.[2] Although pulmonary function is not severely hampered, these patients often have poor physical endurance. Surgical correction not only relieves cardiorespiratory embarrassment when present but also improves posture if performed at an early enough age. Although patients may be operated on for this condition at any age, the operation for infants devised by Brown has been generally abandoned. Ravitch[3] stated that the earlier the condition is corrected the better, the youngest patient in this series being 3 months old. Others[4] preferred to wait until the child is between 3 and 5 years of age.

Sutherland found that preoperative physiotherapy and postural corrective measures were of little or no value. He stated that in children 3 to 5 years of age if the deformity is not too severe it is necessary only to divide the xiphoid and the strong retrosternal ligaments from the sternum. In older children a wedge-shaped osteotomy is performed at the point of sternal angulation sufficient to produce a slight overcorrection. The periosteum is sutured and with healing the overcorrection disappears. Ravitch stated that no external traction is needed in children. He resected from three to five costal cartilages bilaterally. Holmes[4a] did not resect the costal cartilages but restored their normal shape by means of wedge osteotomies at the costochondral junctions and used a Steinmann pin to maintain external traction. In his series Daniel[5] used external fixation on the first two patients then gave it up as wholly unnecessary. Although either a transverse or a midline incision may be used Baronofsky[6] stated that a transverse incision under the breasts gives the most inconspicuous scar and has less of a tendency to keloid formation than a longitudinal scar.

Sutherland encouraged deep breathing exercises as soon as the child came out of anesthesia and this was continued twice daily. He stated that the chest wall was firm in two weeks, after which postural exercises should be given for a prolonged period. In addition to improvement in posture and mental outlook these children show a marked increase in exercise tolerance. Their dyspnea and cardiac arrhythmia disappears. These results more than justify the operation.

---

1. Sutherland, I. D.: Funnel Chest, J. Bone & Joint Surg. **40**:244-251 (May) 1958.

2. *Vogl, A., and Elsbach, P.: Cardiac Displacement in* Pectus Excavatum, Ann. Int. Med. **47**:145-152, July, 1957.

3. (*a*) Ravitch, M. M.: Operative Treatment of Pectus Excavatum, Ann. Surg. **129**:429-444 (April) 1949; (*b*) Pectus Excavatum and Heart Failure, Surgery **30**:178-194 (July) 1951.

4. (*a*) Holmes, C. L.: Pectus Excavatum, J. Thoracic Surg. **33**:321-329 (March) 1957. (*b*) Rehbein, F., and Wernicke, H. H.: Operative Treatment of Funnel Chest, Arch. Dis. Childhood **32**:5-8 (Feb.) 1957.

5. Daniel, R. A., Jr.: Surgical Treatment of Pectus Excavatum, J. Thoracic Surg. **35**:719-725 (June) 1958.

6. Baronofsky, I. D.: Technique for Correction of Pectus Excavatum, Surgery **42**:884-890 (Nov.) 1957.

ORGANIZATION SECTION

STATEMENT REGARDING H. R. 12738, 85TH CONGRESS, APPROPRIATION FOR MILITARY DEPENDENTS BEFORE SENATE COMMITTEE ON APPROPRIATIONS

I am Dr. Hugh H. Hussey of Washington, D. C., Dean of Georgetown University Medical School. I am appearing here today as a member of the Board of Trustees of the American Medical Association to discuss the medical care program for the dependents of members of the uniformed services. Since the inception of the program, I have been a member of the Department of Defense Dependents' Medical Care Advisory Committee.

As passed by the House of Representatives, Section 633 of H. R. 12738, 85th Congress, the Department of Defense appropriation bill contains a ceiling on expenditures which we feel could destroy the Medicare program. It appears from the printed Hearings of the House Appropriations Committee that the inclusion of this section was recommended in an effort to force the Defense Department to care for more dependents in military medical facilities where, the committee stated, the cost would be considerably less than in civilian facilities. Later in this testimony, we shall point out that it has not been established that military dependent medical care can be provided more reasonably than civilian care.

Officers in charge of Medicare have concluded that administering the program under the present language of the appropriations bill would be extremely difficult, if not impossible. In any event, they report that the inclusion of the section would necessitate many major reductions in the benefits now offered to the thousands of dependents who live too far away from military bases to be cared for in military facilities.

As developed in the hearings, before public law 569, 84th Congress, was enacted, 40% of dependents were not receiving any form of medical care provided by the government through the military program. Under the old program, therefore, there was a great disparity in the medical services being obtained by dependents of the members of the various uniformed services—indeed, even among dependents of members of the same service.

It was pointed out by representatives of the Department of Defense that this disparity in benefits contributed to the expensive and rapid turnover of trained personnel in the uniformed services. Recognizing this problem, Congress stated in public law 569 that "the purpose of this Act is to create and maintain high morale throughout the uniformed services by providing an improved and uniform program of medical care for members of the uniformed services and their dependents." This committee has been advised by the Department of Defense that, to date, public law 569 has achieved its purpose, and the Medicare program has brought about a definite improvement in the morale of all uniformed personnel, particularly those who are married.

With some exception the American Medical Association has been pleased, in general, with the way the Medicare program has progressed since it began. We believe the program has been successful, in large measure, because representatives of the armed forces and the medical profession have cooperated closely and because dependents of service personnel have been permitted to choose freely between military and civilian sources of medical care.

The total number of dependents cared for in both military and civilian programs showed an overall increase of 39% since the civilian program was enacted in 1956.

In the first 18 months of the program, less than half of the dependents were cared for in civilian facilities by private physicians. As reported in the House hearings, 43.6% of this group resided too far from a military facility; 14.9% required a type of care not available at the military facility; for 12.8% the military facility was inadequate or overcrowded; 5% required emergency care; the remaining preferred civilian facilities for diverse reasons, including those for whom civilian physicians or hospitals were more convenient.

The Department of Defense reported in the hearings before the House Appropriations Committee that of the dependents receiving care in civilian facilities, 41.4% were maternity cases, 9.5% gynecological conditions, and 22.2% involved tonsillectomies. The tonsillectomies performed included a very large backlog which existed when the program was first enacted.

This same report showed that maternity and gynecological cases, according to several analyses of the Medicare program, constituted the major element of cost and frequency of utilization of both military and civilian facilities.

On the question of comparative costs of medical care for dependents in uniformed services and civilian facilities, it has been claimed in the House Appropriations hearings and before this committee that medical costs in the civilian program are far greater than in the military. We know of no valid studies that have been made by the Department of Defense which accurately compare these costs. To our knowledge, the department has no cost accounting system which isolates the cost of medical care for the dependent patient, particularly the total overall costs of maternity and surgical care.

This committee's attention should be called to the fact that outpatient care is not authorized on the civilian side of the program except for emergencies and obstetrics, although outpatient care is authorized in military facilities. Hence the doctors' fees for surgery and deliveries, including preoperative and postoperative care, and all outpatient care for obstetrics are charged against the per diem cost for a few days in civilian hospitals. For example, a physician's delivery fee would be prorated against a four-day hospital stay, or $31 a day for physician's services alone; whereas, he may have cared for this patient for nine months and will follow up the case later in his office—all for one fee.

Obviously, when the Air Force states that it can provide care for additional dependents on the basis of $10 per day, and the Navy for $16, which we must interpret to mean chiefly for obstetrics and surgery, they are not including outpatient prenatal and postnatal and preoperative and postoperative costs in arriving at these cost figures. Indeed, last year, as a result of similar claims made by the military services before the Appropriations Committees, the Bureau of the Budget, in reference to the cost of medical care in military facilities, stated in a letter of June 11, 1957:

"The military hospital operating costs include only direct costs, omitting many items of expense which, for budget and management purposes, need not be included in a Federal cost reporting system. The rate of $27.50 per day established by the Bureau of the Budget for the purpose of reimbursement between appropriations when dependents of one service are provided care in another service's hospitals does not reflect the true hospitalization cost to the Government.

"At least the following items of expense need to be added to arrive at an approximation of the full cost: depreciation of buildings and fixed equipment; outpatient care incidental to hospitalization; maintenance of a centralized procurement and depot system; maintenance of training facilities directed to increasing proficiency of hospital personnel; and management and professional direction by headquarters' staffs. While the Government is in effect a self-insurer against property and liability damages, such expenses cannot be excluded from a computation of total cost of patient care."

The Budget Bureau letter went on to say:

"There should also be included the costs of fringe benefits provided personnel. Such benefits for military personnel include free life insurance, medical care for the serviceman and his dependents, noncontributory retirement, as well as a number of minor benefits which are not susceptible to cost analysis. The Government also contributes toward the retirement and life insurance of its civilian personnel. While we have included certain of the fringe benefits in our computations, you can appreciate our concern that their costs not be regarded as definitive.

"Working with limited information and conceding that cost analyses of these expenses are not maintained, we have estimated that the above components of hospital expense contribute the following approximate amounts to the cost per patient day of providing care for dependents in military hospitals: depreciation, $1.25; outpatient care, $3.00; supply overhead, 0.45; education and training, 0.85; headquarters overhead, 0.20; liability and property insurance, 0.20; fringe benefits—life insurance, medical and dental care, and retirement—1.70, 0.45, and 0.50, respectively; total, $8.60. If these costs were added to the $27.50 uniformed service reimbursement rate, the total expense would approximate $36."

At the meeting on May 9, 1958 of the Dependents' Medicare Advisory Committee to the Secretary of Defense, a representative of the Bureau of the Budget reported that a survey was being completed which would bring up to date the figures furnished last year. Since May, there has also been an additional cost factor to consider, based on the military and the civilian pay raises recently enacted which will affect the estimates for these costs for fiscal year 1959. These studies by the Bureau of the Budget have now been completed and indicate that the per diem cost for a dependent patient in military facilities will approximate $44. A copy of the Bureau of the Budget's letter of June 27, 1958 is attached for the committee's information. I will appreciate your making it a part of the record.

Whether or not the cost is higher in a civilian facility, and we do not feel that it is, the program nevertheless has done what the purely military medical program could not do—it has cared for those dependents not residing near a military installation, others not residing with their sponsors, and those residing where adequate military facilities are not available.

It has always been our belief that any Dependents' Medical Care Program in the armed services should allow the dependent a free choice of physician and hospital and should not be the basis for an expansion of military medical facilities. We have opposed such expansion of military medical facilities and military medical care activities because of the resulting necessity for the drafting of additional physicians under admittedly discriminatory legislation. In our opinion, if the present restrictions are retained in Section 633, both of these objectives would be defeated.

We feel that if the Congress sees fit to continue to provide, or to expand, medical care for the dependents of members of the armed forces, the services of civilian physicians and hospitals should be used wherever possible, to be paid for at prevailing rates, with provision for free choice of physicians. In our opinion, this is a sound, fair and workable position. It is one which has been tested and one which will benefit the service personnel and their dependents, relieve the unnecessary strain on the military medical services, and aid in the orderly development of community medical services for all of the people.

If the restrictions now in the bill are retained, there will also be a serious effect on service morale. In this connection, it should be remembered that the Dependents' Medical Care Act was instituted less than two years ago by the Congress primarily to attract and keep valuable personnel in the armed forces by giving them one of the fringe benefits that make business and industrial careers attractive.

This program, which is in the nature of a fringe benefit, whose purpose is to maintain high morale in the uniformed services and to encourage more men to enter and remain in a military career, should not be reduced or eliminated. We believe, with Secretary Brucker and the Department of Defense, that the action in setting a limitation on obligations for civilian medical and hospital care for dependents could cause the eventual destruction of the Medicare program.

It does not seem to us to be in the interests of National Defense to destroy one program in order to save 30 million dollars, while, at the same time, provide a military pay raise program costing 600 million dollars when both programs have the same objective.

We recommend, therefore, that Section 633 be eliminated from the House Defense Appropriation bill.

Mr. Chairman, I thank you and the members of the subcommittee for the opportunity of appearing at this hearing.

ANNUAL MEETING, ATLANTIC CITY, JUNE 8-12, 1959

The Scientific Program for the Annual Meeting of the American Medical Association in Atlantic City, June 8-12, 1959, is rapidly taking shape. There will be a full week of lectures, panel discussions, symposiums, motion pictures, color television, and scientific exhibits.

The lecture program for each section of the Scientific Assembly is prepared by the secretary of the section. A prospective participant should communicate at an early date with the secretary of the section before which he wishes to read a paper. The deadline for submission of titles of papers is Dec. 15.

The Scientific Exhibit is arranged by the Council on Scientific Assembly in cooperation with the Representatives to the Scientific Exhibit from the sections. Application blanks for space may be obtained from the section representatives or from the Secretary of the Council on Scientific Assembly. The deadline for submission of application is Jan. 10, 1959, but applicants are urged to send in applications as early as possible before that time.

Application blanks for time on the motion picture program are available also and may be obtained from the Secretary, Council on Scientific Assembly. Films are subject to preview at the discretion of the Council. The deadline is Jan. 10, 1959.

Following are the addresses of the section secretaries and representatives to the Scientific Exhibit from the sections:

Anesthesiology

Secretary—Vincent J. Collins, M.D., New York University-Bellevue Medical Center, 550 First Ave., New York 16.

Exhibit Representative—Edwin L. Rushia, M.D., University Hospital, Augusta, Ga.

Dermatology

Secretary—Edward P. Cawley, M.D., University of Virginia Hospital, Charlottesville, Va.

Exhibit Representative—Stanley E. Huff, M.D., 636 Church St., Evanston, Ill.

Diseases of the Chest

Secretary—Burgess L. Gordon, M.D., The Lovelace Foundation, 4800 Gibson Blvd., S. E., Albuquerque, N. Mex.

Exhibit Representative—Edwin R. Levine, M.D., 111 N. Wabash Ave., Chicago 2.

Experimental Medicine and Therapeutics

Secretary—Elliot V. Newman, M.D., Vanderbilt University Hospital, Nashville 5, Tenn.

Exhibit Representative—Joseph F. Ross, M.D., Department of Nuclear Medicine and Radiation Biology, University of California School of Medicine, Los Angeles 24.

Gastroenterology and Proctology

Secretary—William H. Dearing, M.D., 200 First St., S. W., Rochester, Minn.

Exhibit Representatives—Willard H. Bernhoft, M.D., 2900 Main St., Buffalo 14, and George Gordon McHardy, M.D., 3636 St. Charles Ave., New Orleans 15.

General Practice

Secretary—E. I. Baumgartner, M.D., 25 Alder St., Oakland, Md.

Exhibit Representative—I. Phillips Frohman, M.D., 2924 Nichols Ave., S. E., Washington 20, D. C.

Internal Medicine

Secretary—Rudolph H. Kampmeier, M.D., Vanderbilt University School of Medicine, Nashville 5, Tenn.

Exhibit Representative—Henry T. Ricketts, M.D., 950 E. 59th St., Chicago 37.

Laryngology, Otology, and Rhinology

Secretary—Walter E. Heck, M.D., Stanford University Hospital, San Francisco 15.

Exhibit Representative—Walter H. Maloney, M.D., University Hospitals, 2065 Adelbert Rd., Cleveland 6.

Military Medicine

Secretary—Col. Charles H. Bramlitt, M.C., U. S. A. F., Directorate of Professional Services, Office of the Surgeon General, Washington 25, D. C.

Exhibit Representative—Capt. Robert V. Schultz, M.C., U. S. N., Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D. C.

Nervous and Mental Diseases

Secretary—A. L. Sahs, M.D., University Hospitals, Iowa City.

Exhibit Representative—Benjamin Boshes, M.D., Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11.

Obstetrics and Gynecology

Secretary—Keith P. Russell, M.D., 511 S. Bonnie Brae St., Los Angeles 57.

Exhibit Representative—Frederick H. Falls, M.D., 715 Lake St., Oak Park, Ill.

Ophthalmology

Secretary—Harold G. Scheie, M.D., 313 S. 17th St., Philadelphia 3.

Exhibit Representative—Frank W. Newell, M.D., 950 E. 59th St., Chicago 37.

Orthopedic Surgery

Secretary—Robert J. Joplin, M.D., 1180 Beacon St., Brookline 46, Mass.

Exhibit Representative—James I. Kendrick, M.D., 2020 E. 93rd St., Cleveland 6.

Pathology and Physiology

Secretary—Hugh A. Edmondson, M.D., 1200 N. State St., Los Angeles 33.

Exhibit Representative—Samuel A. Levinson, M.D., L. A. Weiss Memorial Hospital, 4646 N. Marine Dr., Chicago 40.

Pediatrics

Secretary—Arild E. Hansen, M.D., 812 Mechanic, Galveston, Texas.

Exhibit Representative—F. Thomas Mitchell, M.D., LeBonheur Children's Hospital, Memphis 5, Tenn.

Physical Medicine

Secretary—Earl C. Elkins, M.D., 200 First St., S. W., Rochester, Minn.

Exhibit Representative—Harold Dinken, M.D., 1756 Race St., Denver 6.

Preventive Medicine

Secretary—Frank Princi, M.D., University of Cincinnati College of Medicine, Cincinnati 19.

Exhibit Representative—Paul A. Davis, M.D., 633 E. Market St., Akron 4, Ohio.

Radiology

Secretary—Traian Leucutia, M.D., Harper Hospital, Detroit 1.

Exhibit Representative—Richard H. Chamberlain, M.D., 3400 Spruce St., Philadelphia 4.

Surgery, General and Abdominal

Secretary—Gustaf E. Lindskog, M.D., 333 Cedar St., New Haven 11, Conn.

Exhibit Representative—Julian Johnson, M.D., 3400 Spruce St., Philadelphia 4.

Urology

Secretary—Edward H. Ray, M.D., 203 W. Second St., Lexington, Ky.

Exhibit Representative—E. F. Poutasse, M.D., Cleveland Clinic, 2020 E. 93rd St., Cleveland 6.

NOMINATIONS FOR GENERAL PRACTITIONER AWARD

Nominations for the General Practitioner of the Year award should be submitted to the American Medical Association headquarters as soon as possible. The award winner is chosen from nominations made by the constituent societies. Final selection is made by a committee appointed by the Chairman of the Board of Trustees. The winner will be announced Dec. 2 at the opening session of the House of Delegates at the Minneapolis Clinical Session.

COUNCIL ON MEDICAL SERVICE

COMMITTEE ON MATERNAL AND CHILD CARE

Conference on Perinatal Mortality and Morbidity Study Programs.—On July 26 and 27, the Committee on Maternal and Child Care of the Council on Medical Service sponsored a conference to develop recommendations for a basic flexible program that may be used by state and county medical societies, state and local health departments, and individual hospitals in their efforts to reduce deaths and morbidity resulting from conditions of the perinatal period. Participating in the conference were representatives of the College of American Pathologists, the American College of Obstetricians and Gynecologists, the American Association for Maternal and Infant Health, the Children's Bureau, the Association of State Maternal and Child Health and Crippled Children Directors, the American Academy of General Practice; the American Academy of Pediatrics, the National Institute of Neurological Disease and Blindness and the Human Embryology and Development Study Section of the National Institutes of Health; the American Hospital Association, the American Society of Anesthesiologists, and the American Public Health Association.

The immediate objective of the conference was to develop a set of guides for perinatal study committees similar to those developed last year for maternal death study committees. Since perinatal study committees now exist in individual hospitals, on a city-county-wide basis, and on a statewide basis, one of the early tasks of the conference was to make certain that the guides would be suitable to the needs of all three. Some of the most difficult decisions to make had to do with terms, definitions, and the calculation of rates to be used in study programs involving perinatal mortality and morbidity.

During 1957 and early 1958 the Committee on Maternal and Child Care sponsored field studies of many statewide, citywide, and individual hospital perinatal mortality study programs. It also held two regional conferences, one in Philadelphia and the other in Chicago. With these as a background, and the conference July 26 and 27, the Committee hopes to complete its guides late this fall.

POSITIVE HEALTH PROGRAM FOR SENIOR CITIZENS

Proceedings Available:—Numerous requests have been received for copies of papers presented at the A. M. A. Planning Conference for Medical Society Action in the Field of Aging, held in Chicago, Sept. 13-14, 1958, as well as the "A. M. A.'s Positive Health Program for Senior Citizens." A full report on the Conference, including all addresses, and the Positive Health Program will be available about Nov. 20, 1958. Physicians desiring copies may send their requests to: Council on Medical Service, American Medical Association, 535 N. Dearborn, Chicago 10.

MEDICINE AND THE LAW

TAX DEDUCTION OF PROFESSIONAL ENTERTAINMENT EXPENSES

The Central Medical Society of Jackson, Miss., has received the following ruling from the District Director of the Internal Revenue Service in Jackson setting forth the most detailed statement regarding the deduction of physician's entertainment expenses that has come to the Law Department's attention.

Following is the answer to the questions in your letter of June 4, 1958, concerning the deductibility, for federal income tax purposes, of doctors' entertainment expenses. We have no objections to this information being passed along to other physicians.

1. A physician may deduct on his federal income tax return the costs of entertainment, provided he can establish to the satisfaction of the Internal Revenue Service, by appropriate evidence, that such expenses are ordinary and necessary business expenses and clearly related to the production of business income.

2. The amount of the deduction must be proved and its reasonableness determined. Once the amount is established, the deduction may be claimed when the doctor is able to show that the entertainment had a direct relationship to the conduct of his practice and can show the business benefit reasonably to be expected from the expenditure. The general statement that he hoped or expected to get referrals or patients as a result of the entertainment is not enough. If personal reasons predominate, the expenditure may not be deducted, even though there is some possibility of a business benefit. Except in the case of industrial physicians, entertainment of individuals who are not doctors will not ordinarily qualify because the possibility of benefits to be expected is so remote as to be negligible. In instances of the entertainment of patients, the same general rules apply as in the entertainment of other doctors, and the clear relationship of the expenditure to reasonably expected income must be shown. The same rules also apply to civic and other club dues.

Criteria to be used in establishing the deductibility of entertainment expenses include, but are not limited to, the following:

a. Specific purpose of entertainment. b. Nature of the practice of the doctor incurring the expenditure. c. Period of time the doctor has been in practice and the number of patients he already has. d. Percentage of his patients received as referrals. e. Names of individuals entertained and reason why additional income could reasonably be expected from each. f. Whether or not referrals were actually received from the doctors entertained and any indication of the effect of the entertainment on these referrals. g. Number of times individual doctors were entertained during the year, inasmuch as repeated entertainment indicates a personal motive. h. Whether or not other doctors in the same type practice in the locality have entertainment expenses.

We trust that the above will be helpful in clarifying this area of tax law and administration.

OPINIONS OF JUDICIAL COUNCIL

The Judicial Council has authorized the publication of the following opinions.

QUESTION: May I, as a patient's attending physician, discuss patient's history, diagnosis, treatment, prognosis, etc., with patient's attorney?

ANSWER: Yes, with the consent of the patient. The Principles of Medical Ethics recognize in Section 10 that the physician has obligations to society as a whole in addition to his obligations to his patient as an individual. In many instances, the peculiar knowledge and attainments of the physician are indispensable to patients or others in the administration of business and government and in the usual conduct of certain daily affairs. When this knowledge, acquired during the course of the physician-patient relationship, is necessary to enable the patient to obtain his just due the physician should make it available for patient's benefit under proper conditions. Discussion with or report to the patient's attorney may be proper and necessary in order for patient to perfect a claim. The attending physician may ethically discuss patient's history, etc. with the attorney providing, of course, patient has consented to the discussion.

QUESTION: We have just completed a new "medical arts" building to house a group of us who are practicing as individuals. We would like to have an "open house" for the public. Is this permissible?

ANSWER: Section 5 of the Principles proscribes the solicitation of patients. If the intent for having the "open house" is to solicit patients, even indirectly, then it would be contrary to the Principles. If, however, motivation for holding open house stems from civic and natural pride in having made a contribution to the community and to medicine then the practice may not be objectionable. In the latter instance, the holding of an open house might have the effect of acquainting the citizens of the community with some of the improvements developed for better patient care, comfort, and convenience. It might tend to convince the public that there is no apathy on the part of doctors when it comes to improving all facets of medical care.

Before a physician or a group of physicians hold such an open house, however, it is incumbent on him or them to discuss the proposal with appropriate officers of the component medical society. Communities and customs differ. The local society must assess local custom and usage and insure that neither the dignity of medicine nor local custom and tradition are offended by any particular practice of doctors.

QUESTION: What does the statement in Section 7 of the Principles mean when it says drugs, remedies, and appliances may be supplied by the physician provided it is in the best interest of the patient?

ANSWER: It is the opinion of the Judicial Council that this language was adopted to permit both the practicing physician and the local medical societies to evaluate the many factual situations incident to prescribing and dispensing which are bound to arise in the practice of medicine. Under this language the doctor is permitted to exercise his own best judgment when caring for his patients. It is known that there will be situations when it is necessary or desirable for a physician to dispense or supply what he has prescribed. The Principles permit this to be done. On the other hand, this broad language provides a means by which a component medical society can inquire into the facts of a particular practice. The profession thus can act to prevent abuse of discretion and protect patients from exploitation. In essence this language means that a physician in the exercise of sound discretion may dispense "in the best interest of his patient"; it does not authorize him to dispense solely for his convenience or for the purpose of supplementing his income.

QUESTION: Is it ethical to have another doctor perform surgery on my patient without patient's knowledge and consent?

ANSWER: No. The Principles in Section 2 state that the principal objective of the medical profession is to render service to humanity with full respect for the dignity of man. To have another physician operate on one's patient without that patient's consent, and without his knowledge of the substitution, is a fraud and deceit and a violation of a basic ethical concept. The patient as a human being is entitled to choose his own physician and he should be permitted to acquiesce in or refuse to accept the substitution.

A statement, prepared by the Law Department, is reproduced here as being educational on this matter.

> The surgeon's obligation to the patient requires him to perform the surgical operation: (1) within the scope of authority granted him by the consent to the operation; (2) in accordance with the terms of the contractual relationship; (3) with complete disclosure of all facts relevant to the need and the performance of the operation; and (4) to utilize his best skill in performing the operation.
>
> It should be noted that it is the operating surgeon to whom the patient grants his consent to perform the operation. The patient is entitled to the services of the particular surgeon with whom he contracts. The surgeon in accepting the patient obligates himself to utilize his personal talents in the performance of the operation to the extent required by the agreement, creating the physician-patient relation. He cannot properly delegate to another the duties which he is required to perform personally.
>
> Under the normal and customary arrangement with private patients, and with reference to the usual form of consent to operation, the surgeon is obligated to perform the operation himself, and he may use the services of assisting residents or other assisting surgeons to the extent that the operation reasonably requires the employment of such assistance. If a resident or other physician is to perform the operation under the guidance of the surgeon, it is necessary to make a full disclosure of this fact to the patient, and this should be evidenced by an appropriate statement contained in the consent.
>
> If the surgeon employed merely assists the resident or other physician in performing the operation, it is the resident or other physician who becomes the operating surgeon. If the patient is not informed as to the identity of the operating surgeon, the situation is "ghost surgery."
>
> An operating surgeon is construed to be a performing surgeon. As such his duties and responsibilities go beyond mere direction, supervision, guidance, or minor participation. He is not employed merely to supervise the operation. He is employed to perform the operation. He can properly utilize the services of an assistant to assist him in the performance of the operation. But he is not performing the operation where his active participation consists of guidance or standby responsibilities in the case of an emergency.

QUESTION: Is it ethical to disclose history, diagnosis, prognosis, etc., during the physician-patient relationship concerning my patient to an insurance company's representative?

ANSWER: Yes, if patient has consented to the disclosure. As recognized in Section 10 of the Principles a physician's responsibilities to his patient are not limited to the actual practice of medicine. They also include the performance of some services ancillary to the practice of medicine. These services might include certification that patient was under the physician's care and comment on the diagnosis and therapy in the particular case.

MEDICAL NEWS

ARKANSAS

Dr. Paul Day Goes with Food and Drug Administration.—The U. S. Commissioner of Food and Drugs, George P. Larrick, has announced the appointment of Paul L. Day, Ph.D., head, department of biochemistry and assistant dean, Graduate School, University of Arkansas School of Medicine, Little Rock, as scientific director of the U. S. Food and Drug Administration. Dr. Day who has been with the University of Arkansas School of Medicine for 31 years, is the author of many research papers in biochemistry and nutrition, a member of the Biochemistry Committee, National Board of Medical Examiners, and of numerous scientific societies, boards, and committees. He will assume his new position with the Food and Drug Administration sometime before the first of the year.

Personal.—Dr. Philip P. Ellis has been appointed associate professor to head the ophthalmology division in the department of surgery at the University of Arkansas Medical Center, Little Rock. Dr. Ellis formerly was assistant professor of ophthalmology at the State University of Iowa, Iowa City. The department has been awarded a $25,000 grant from the National Institutes of Health to be used toward paying salaries of personnel in the newly-created division.

CALIFORNIA

Personal.—Jacob Yerushalmy, Ph.D., professor of biostatistics, School of Public Health, University of California School of Medicine, Berkeley-San Francisco, has been appointed to the National Advisory Neurological Diseases and Blindness Council for a four-year term, the Surgeon General, U. S. Public Health Service, has announced.

COLORADO

Conference on Staphylococcal Disease.—A regional conference on the control of staphylococcal disease sponsored by the U. S. Public Health Service and Colorado State Department of Public Health was held in Denver, Oct. 15. Representatives from the Departments of Public Health of Wyoming, Utah, Montana, Idaho, and Colorado, Denver Department of Health and Hospitals, University of Colorado Medical Center, state medical societies in the Rocky Mountain Region, personnel from the Communicable Disease Center, Atlanta, hospital associations, Denver Medical Society, the Veterinary Medical School of Colorado State University, nursing associations, and many hospitals, participated. The forenoon was spent in sizing up the problem and the afternoon in working committees aimed at what to do to solve this problem.

CONNECTICUT

Personal.—Dr. Wilfred Bloomberg, of the Southern Regional Education Board staff, has accepted the post of commissioner of mental health for the state of Connecticut. He had been serving SREB temporarily as associate director for mental health. ——Dr. Seymour L. Lustman, formerly a clinical fellow in the Child Study Center, has been appointed associate professor in the department of psychiatry at Yale University School of Medicine, New Haven.——Dr. Denis Abelson, senior registrar and medical tutor at the Postgraduate Medical School in London, has been appointed assistant professor of preventive medicine at Yale University School of Medicine, New Haven. Dr. Abelson previously served at Yale as a research fellow in physiology.

DISTRICT OF COLUMBIA

Dr. Wolf to Head Department at Illinois.—The board of trustees of the University of Illinois College of Medicine, Chicago, has approved the appointment of Arnold V. Wolf, Ph.D., as head of the department of physiology at the College of Medicine, Chicago, effective Dec. 1. Dr. Wolf, presently chief, Renal Branch, Cardiovascular-Pulmonary Division, Walter Reed Army Institute of Research, will succeed Dr. George E. Wakerlin, who resigned to become medical director of the American Heart Association. Dr. Wolf for 10 years taught at Albany Medical College, New York. He is the author of many scientific publications and his book on the function of the kidney is said to be regarded as a classic. He is a charter member of the American Society for Artificial Internal Organs, and a member of the American Physiological Society and the American Association for the Advancement of Science.

ILLINOIS

Chicago

Alumni Seminar Day.—The University of Illinois Medical Alumni Seminar Day will be held Nov. 22 and all alumni of the College of Medicine are in-

---

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

vited. Speakers will include Dr. Granville A. Bennett, dean of the College of Medicine, and Dr. Carl A. Hedberg, president of the Medical Alumni Association. Two panel discussions are planned: "Blood Transfusions and Laboratory Aids in Diagnosis of Medicine Problems" and "Recent Advances in Surgery," which will be followed by question-and-answer periods. Seminars will be conducted in the afternoon by the departments of medicine, surgery, pediatrics, and obstetrics and gynecology. The medical seminar is co-sponsored by the College of Medicine and the Medical Alumni Association. Dr. Louis R. Limarzi, associate professor of medicine, is program chairman.

Personal.—Martin C. E. Hanke, Ph.D., associate professor of biochemistry at the University of Chicago, has been appointed director of the Clinical Chemistry Laboratory at the university's medical and biological research center.——Dr. Otto C. Koluvek and Dr. Samuel C. Udell have been elected to the Board of Trustees of the Chicago Medical School. Both men are alumni of the School.

INDIANA

Personal.—Dr. John L. Reck, of Sheridan, was honored recently with an open house and reception sponsored by Sheridan service clubs and merchants. He completed 50 years as a practicing physician in June. In 1955 Dr. Reck was the recipient of the first annual "Outstanding Citizen" award, given by the Sheridan Rotary Club.——Dr. Frank E. Wiedemann, Terre Haute, marked his 64th year of practice by cancelling all medical indebtedness on his books. He has done this several times in the past, the last time in 1956.

KANSAS

Society News.—New officers of the Kansas Society of Pathologists are: Dr. Leo P. Cawley, Wichita, president; Dr. Tom R. Hamilton, Kansas City, Kan., vice-president; Dr. William J. Reals, Wichita, secretary-treasurer and Councilor to the American Society of Clinical Pathologists; Dr. Richard F. Looker, Wichita, alternate councilor.

MARYLAND

Personal.—Dr. Isadore Kaplan has been named medical director of the Baltimore and Ohio Railroad Company, with system jurisdiction at Baltimore to succeed Dr. Samuel M. English, who retired July 1. Dr. Kaplan joined the B & O's medical department in January, 1946.——Dr. Russell A. Nelson, director of the Johns Hopkins Hospital, Baltimore, has been named president-elect of the American Hospital Association.

MASSACHUSETTS

Boston University Grants.—The Department of Health, Education and Welfare, has made the following grants: $30,186 to Dr. Henry J. Bakst, Brookline, professor of preventive medicine, Boston University School of Medicine, for program expansion in rehabilitation training in medicine. Brenton R. Lutz, Ph.D., Melrose, professor emeritus of biology, $22,982 to continue his research on the reaction of blood vessels to chronic high blood pressure. I. Alden Macchi, Ph.D., Newton Upper Falls, assistant professor of biology, $9,813 to continue his study of adrenal hormones. Walter J. Gensler, Ph.D., Belmont, professor of chemistry, $8,400 to investigate the possible use of an extract of tree resin in the treatment of cancer.

Personal.—Dr. Harry Blotner, Boston, has been appointed visiting research professor of science at Nasson College, Springvale, Maine.

MICHIGAN

"Visiting Chief Day" at Sinai Hospital.—At Sinai Hospital of Detroit on Nov. 5, the visiting Chief was Dr. Edward B. Solomons, professor of obstetrics and gynecology, State University of New York College of Medicine at New York City, Brooklyn, and formerly of Rotunda Hospital, Dublin, Ireland. The program consisted of a clinical conference at 10 a. m., and a motion picture and discussion on the Manchester operation at 1 p. m.

State Medical Election.—At the 93rd annual meeting of the Michigan State Medical Society in Detroit, held Oct. 4, the following new officers were elected: incoming president, Dr. Gilbert B. Saltonstall, of Charlevoix; president-elect, Dr. Milton A. Darling, of Detroit; speaker, Dr. Kenneth H. Johnson, of Lansing; and delegates to the American Medical Association for two-year terms, Drs. Wyman D. Barrett and Robert L. Novy, Detroit, and George W. Slagle, Battle Creek.

Michigan's Hearing Conservation Program.—In its 15th anniversary report on the state-local hearing conservation program, the Michigan Department of Health notes that group tests to find previously undetected cases of hearing loss have been given to 2,052,942 Michigan school children since 1943. In the present year the 60 locally employed technicians working in all parts of the state will screen about 350,000 children. Group technicians are paid by the school, local health departments, and other local organizations. The announcement said that of every 10,000 children given group screening, 50 to 75 are found to have losses that handicap or can't be corrected medically. The Michigan Department of

Health helps provide consultant services for children who may be given hearing aids, special training, or referred to the Michigan School for the Deaf, where they are taught how to use the hearing aid. The state, since 1947, has purchased 463 hearing aids for medically indigent children.

MINNESOTA

Personal.—Dr. Jurgen Aschoff, professor of physiology, Max Planck Institute at Heidelberg, Germany, conducted a seminar on "The Measurement of Blood Flow by Thermal Conductance" Sept. 19 at the Mayo Foundation, Rochester.——Dr. Howard B. Burchell, Rochester, has been appointed to the National Advisory Heart Council for a four-year term, the Surgeon General, U. S. Public Health Service, has announced.—Dr. Howard B. Burchell, professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, has been appointed to a 4-year term, beginning Oct. 1, as a member of the National Advisory Heart Council.——Dr. Archibald I. S. MacPherson, of the University of Edinburgh, Scotland, lectured at the Mayo Clinic, Rochester, October 13, on "Portal Hypertension and Its Treatment," and Dr. Joseph H. Boyes, of the University of Southern California School of Medicine at Los Angeles, conducted a seminar at the Clinic, October 10, on "Tendon Grafts in the Fingers and Thumb."

MONTANA

Society News.—At the annual meeting of the Montana Chapter of the American Academy of General Practice, Dr. Amos R. Little Jr., Helena, was elected president to succeed Dr. William E. Harris, Livingston. Dr. Philip D. Pallister, Boulder, was named vice-president and Dr. Harry R. Soltero, Billings, president-elect. Dr. Vernon D. Standish, Bigtimber, was re-elected secretary-treasurer.

NEVADA

Society News.—Officers of the American Academy of General Practice, Nevada Chapter, elected for 1958-1959 are: Drs. Robert V. Broadbent, Reno, president; Dennis Cunningham, Las Vegas, president-elect; and Richard C. Sheretz, Reno, secretary-treasurer. The 1959 meeting will be held in Reno in June and members of the staff of the Medical School of the University of Southern California, Los Angeles, will organize and present the program.

NEW YORK

The Harrington Lecture.—The University of Buffalo School of Medicine presented the Harrington Lecture Oct. 30. The lecturer was Dr. Robert A. McCance, professor of experimental medicine, University of Cambridge, England, whose subject was "Calories."

Dr. Hilleboe Honored.—The University of Buffalo School of Medicine on Oct. 18 awarded Dr. Herman E. Hilleboe, state health commissioner, a citation as "an outstanding protector of public health, both in America and abroad." The citation further read "we are particularly grateful to him for his interest and cooperation with the University of Buffalo School of Medicine, particularly for assistance in developing the Chronic Disease Research Institute and for his outstanding work with the Roswell Park Memorial Institute."

Personal.—Dr. Julius S. Prince, health officer of the Jamestown District Office, New York State Department of Health, is scheduled to leave this fall for a two-year tour of duty in Ethiopia as chief of the Health Division for the International Cooperation Administration.

New York City

Conference on Tuberculosis.—The Council of the Tuberculosis and Health Associations of Greater New York will hold a Conference on Tuberculosis: A World-Wide Problem, in the Biltmore Hotel Nov. 18, 3 p. m. Dr. Georges J. Canetti, chief of laboratories, Pasteur Institute, Paris, France, will speak on "Changes in the Nature of Tuberculosis from the Standpoint of Pathology"; Dr. Leona Baumgartner, New York City commissioner of health, on "Urban Reservoirs of Tuberculosis"; and Dr. Stig Johannes Holm, Geneva, Switzerland, chief, Tuberculosis Section, WHO, on "How Can Elimination of Tuberculosis as a Public Health Problem Be Achieved?"

Increase in Deaths from Tuberculosis.—The municipal health department reports that the number of deaths in the five boroughs of New York City during the year ending last June 30 was 1,021, an increase of 4.1% beyond that of the previous 12-month period. The largest increase, 11.3%, was in Manhattan. The increase in deaths in Brooklyn was 9.2% and in the Bronx 3%. In Richmond there was a decrease of 11.8% in deaths from tuberculosis. According to the New York Tuberculosis and Health Association, 6,233 new cases of tuberculosis were reported during the year mentioned. The municipal department of health was said to have records of 10,852 known cases of active tuberculosis in New York City.

Dr. Ochoa Honored.—At a reception at the New York University–Bellevue Medical Center Oct. 20, Dr. Severo B. Ochoa, chairman, department of biochemistry, was guest of honor. Dr. Ochoa received the Borden award during the annual meeting of the Association of American Medical Colleges in Philadelphia, Oct. 13. The award was based on his "isolation of the enzyme in crystalline form which catalyzes the condensation of oxaloacetic acid and acetyl coenzyme A to form citric acid and for his discovery and studies of polynucleotide phosphorylase." Dr. Ochoa, a graduate of the University of Madrid, Spain, has held faculty appointments at his alma mater; Oxford University Medical School, England; Kaiser-Wilhelm Institute for Medical Research, Heidelberg, Germany; and Washington University School of Medicine, St. Louis. He is a winner of the Neuberg Medal award in biochemistry, a past-president of the Harvey Society, and is a member of the National Academy of Sciences and the Council of the Society of Biological Chemists.

Affiliation of University and Institute.—New York University and the Institute for the Crippled and Disabled agreed on Sept. 25 to undertake joint efforts in rehabilitation research, teaching, and services to the handicapped. The documents of professional affiliation were signed before trustees and officers of the two institutions and distinguished guests, including Bernard Baruch, and Jeremiah Milbank, who founded the institute in 1917. The agreement, effective Nov. 1, among other things, is to provide all "types of service necessary for the handicapped to attain his fullest physical, social, and economic capability, and to undertake joint research into all areas of rehabilitation." The university and the institute will continue to function as financially independent, self-controlled institutions, and their rehabilitation activities will be coordinated through the university's recently created Center for Rehabilitation Services. The Institute for the Crippled and Disabled is an outpatient rehabilitation center whose services include medical treatment, social adjustment, and vocational training programs. It has facilities for making artificial limbs, a rehabilitation library said to be the largest of its kind, and it carries on research. The Institute will continue its joint efforts on specific projects with Columbia University, Presbyterian Hospital, and other institutions.

NORTH CAROLINA

Personal.—Dr. David R. Hawkins, associate professor of psychiatry, University of North Carolina School of Medicine, Chapel Hill, has been appointed a member of the Mental Health Small Grant Committee of the National Institute of Mental Health for a term of four years.——By direction of the Secretary of the Air Force, Dr. Herbert A. Saltzman, who is now on the faculty of Duke University School of Medicine, Durham, has been awarded the Air Force Commendation Medal.

OHIO

University News.—Studies of the relationships between speech and personality characteristics which have been carried on for three years in the University of Cincinnati College of Medicine department of psychiatry will be continued with a three-year grant of $50,000 made to Dr. Louis A. Gottschalk, associate professor of psychiatry. The grant was awarded by the U. S. Public Health Service, which also subsidized the previous years of research.

OREGON

Personal.—Dr. J. V. Straumfjord, of Astoria, has been appointed by Governor Holmes of Oregon to the State Board of Medical Examiners to fill the vacancy created by the death of Wilmot C. Foster. Dr. Straumfjord from 1929 to 1934 was on the staff of the University of Oregon Medical School and from 1930 to 1934 was a staff member of the Dr. Robert C. Coffey Clinic and Hospital. He has been engaged in private practice in Astoria since 1934.

PENNSYLVANIA

Bockus Society of Gastroenterology.—The Bockus International Society of Gastroenterology has been organized by alumni of the Graduate School of Medicine of the University of Pennsylvania. Dr. James L. D. Roth, secretary-general of the society and associate professor of gastroenterology, said the establishment of the group was accomplished under the impetus of Dr. Figueiredo Mendes, of Rio de Janeiro, Brazil, an alumnus of the school, who was elected president of the new society, with Dr. Jose Maria De La Vega, Mexico City, president-elect. Dr. Henry L. Bockus, chairman, department of internal medicine, University of Pennsylvania Graduate School of Medicine, was made honorary president. The group will study geographical differences in behavior patterns and epidemiology of diseases in different parts of the world. Its annual meeting will be held just prior to that of the American Gastroenterological Association or in accordance with the International Congress of Gastroenterologists. At the first annual meeting in Philadelphia, June 3, 1959, work groups will be organized to undertake collaborative research on projects to be reported on at future meetings.

Philadelphia

University News.—A Health Research Facilities Grant of $46,038 to The Woman's Medical College of Pennsylvania has been approved by the U. S. Public Health Service to purchase scientific equipment for the college's 2 million dollar Research Wing to be constructed this fall. The new six-story addition will provide space for an expanded Department of Physiological Chemistry and for the

Basic Science and Clinical Departments. A federal grant of one-half million dollars to help meet its construction costs was awarded to the college this spring.

TENNESSEE

University News.—A $95,000 grant to finance the study of the effects of exposure to relatively low amounts of radiation on bodily function has been awarded by the Surgeon General's Office, Department of the Army, to two investigators at the University of Tennessee College of Medicine. They are Richard R. Overman, Ph.D., director, Clinical Physiological Laboratories, and Dr. David S. Carroll, professor of radiology.

TEXAS

Personal.—Dr. William P. Wilson, assistant professor of psychiatry and neurology, Duke University, has been appointed director of psychiatric research and as professor of psychiatry and neurology, University of Texas Medical Branch, Galveston.—— D. Bailey Calvin, Ph.D., formerly Dean of Students and Curricular Affairs, University of Texas Medical Branch, Galveston, has been made Director of the Office of Research Grants and Contracts.

VERMONT

University News.—Dr. George A. Wolf Jr., University of Vermont College of Medicine, Burlington, has returned from Iran, where at the request of the University of Teheran Medical School he served as consultant, concerning the curriculum, under the auspices of the International Cooperation Administration.——Dr. John H. Bland, associate professor of medicine, has begun a year of study at the University of Manchester, England, with Prof. J. H. Kellgren, director of the Rheumatic Center there. ——William H. Macmillan, Ph.D., assistant professor of pharmacology, is on a year's leave of absence from the University of Vermont College of Medicine, working in the laboratory of Prof. J. H. Burn at the University of Oxford, England. Dr. Wilhelm Raab, professor of experimental medicine, has returned from a year's work in laboratories of the medical clinic of the University of Innsbruck, Austria.

VIRGINIA

Society News.—Dr. W. Linwood Ball, of Richmond, was installed as the twelfth president of the Virginia Academy of General Practice May 10. Other officers elected were: Dr. Fletcher J. Wright Jr., Petersburg, president-elect; Dr. William J. Hagood Jr., of Clover, vice-president; Dr. Russell G. McAllister and Dr. William A. Young, both of Richmond, reelected to serve as secretary and treasurer, respectively; Dr. John O. Boyd Jr., of Roanoke, reelected A. A. G. P. delegate; Dr. Rufus Brittain, of Tazewell, his alternate.

WASHINGTON

Dr. McDonald Goes to New York.—Dr. Ronald F. McDonald, head, division of urology, University of Washington School of Medicine, Seattle, has moved to Rochester, N. Y., where he has been appointed professor and head of the University of Rochester's division of urology. Dr. McDonald came to Seattle in 1949 from the University of Chicago.

GENERAL

Grants for Research in Leukemia.—The Leukemia Society, Inc., has announced the availability of grants-in-aid for research projects concerned with the cause or cure of leukemia and allied diseases. Applications, which may be made at any time, are reviewed by the Selection Committee quarterly: March, June, September, and December.

Medical Writers' Meeting in Philadelphia.—The 1958 fall meeting of the Delaware Valley Chapter of the American Medical Writers' Association will be held Nov. 17, 8:30 p. m., at the College of Physicians, Philadelphia. Rudolf Flesch, Ph.D., will present the Wyeth Lectureship, "The Right Way to Medical Writing," and also will review various medical journals. All persons interested in improving communication in medicine are invited. Fee for dinner at 6 p. m. for members and guests is $5.

Association of Blood Banks.—The 11th annual meeting of the American Association of Blood Banks will be in Cincinnati, Ohio, November 20-22. A scientific program will comprise individual papers, panels, and technical workshops throughout the meeting. The administrative section of the program also will include panel discussions. At the annual banquet Friday evening, the guest speaker will be Robert Dechert, Assistant Secretary of Defense, Washington, D. C.

Society News.—Dr. Edward B. D. Neuhauser of Boston was made president-elect of the American Roentgen Ray Society at the recent 59th annual meeting in Washington, D. C. Other officers elected were: Drs. Franklin B. Bogart, Chattanooga, Tenn., first vice-president; Arthur B. Soule, Jr., Burlington, Vt., second vice-president; C. Allen Good, Rochester, Minn., secretary; and Robert K. Arbuckle, Oakland, Calif., treasurer. The next annual meeting will be in Cincinnati, Ohio, September 21-25, 1959.

Scholarships for Neuromuscular Studies.—The Sister Elizabeth Kenny Foundation has announced continuation of its program of post-doctoral scholarships to promote work on neuromuscular diseases. Each grant will provide a stipend for five years at the rate of $5,000 to $7,000 a year, depending on the scholar's qualifications. Candidates from medical schools in the United States and Canada are eligible. Inquiries should be addressed to: Dr. Edgar J. Huenekens, medical director, Sister Elizabeth Kenny Foundation, Inc., 2400 Foshay Tower, Minneapolis 2, Minn.

Meeting on Psychoanalysis.—The Academy of Psychoanalysis held its mid-winter meeting at the Roosevelt Hotel, New York City, Nov. 6-7, under the presidency of Dr. Jules H. Masserman, of Chicago. The title for the Saturday morning session was "Psychoanalysis Today, Its Goals and Aspirations," on which subject Dr. George J. Mohr, clinical professor of psychiatry, University of Southern California School of Medicine, Los Angeles, presented an essay which was followed by a discussion in five individual presentations. On Sunday morning seven individual speakers were presented and their papers were discussed Sunday afternoon.

American Rheumatism Association.—The Fifth Interim Scientific Session of the American Rheumatism Association will be held December 6 at the Mayo Clinic, Rochester, Minn., under the presidency of Dr. Joseph J. Bunim. The general subjects of the sessions beginning Saturday, 9 a. m., will be immunologic studies, clinical studies, miscellaneous studies. Chairman of the program committee is Dr. James B. Wyngaarden, Durham, N. C. The vice-chairmen in charge of the Interim Session are Drs. Gene H. Stollerman, Chicago; Hans Waine, Boston, Mass.; and Morris Ziff, New York City. The address at the banquet in the Kahler Hotel will be presented by Dr. Philip S. Hench of Rochester on "Walter Reed and the Conquest of Yellow Fever."

Foreign Virologists Visit U. S.—Eight virologists from as many lands began a nine-weeks polio study course when they arrived at the Pan American Sanitary Bureau, Regional Office for the Americas of the World Health Organization, Oct. 2. All are studying "Polio Diagnostic Techniques, and Vaccine Production and Control" under WHO's fellowships program. The fellows come from U. S. S. R., Chile, Egypt, Nigeria, Poland, Lebanon, Austria, and French Equatorial Africa. Their itinerary includes training and observation at the Communicable Disease Center laboratories in Montgomery and Atlanta, and the Institute of Microbiology Polio Laboratory in Montreal as well as a visit to three pharmaceutical companies producing polio vaccine in Detroit and Indianapolis.

United Cerebral Palsy.—The annual scientific session of United Cerebral Palsy, 321 W. 44th St., New York 36, will be at the Mayflower Hotel, Washington, D. C., November 15. The morning session will be given over to eight papers and discussions on "The Problem of Hemiplegia—A Critical Evaluation," under the aegis of the clinical advisory committee. The afternoon session will be a continuation of discussions on the same general subject. The meeting is open without charge to physicians, medical students and other professional workers in related fields concerned with cerebral palsy. The president of United Cerebral Palsy is Roger S. Firestone, president of Firestone Plastics Company, and the executive vice-president, Stanley C. Hope, president of Esso Standard Oil Company.

Awards to Medical Periodicals.—At its September meeting in Chicago, the American Medical Writers' Association announced the 1958 honor awards for distinguished service in medical journalism to the following periodicals: *Cleveland Clinic Quarterly*, published by the Cleveland Clinic; *Harper Hospital Bulletin*, published by the Harper Hospital, Detroit; *The Bulletin of the Fulton County Medical Society*, Atlanta, Ga. (award for periodicals of county or city medical societies with a membership of 500 or more); *The Medical Record*, published by the Berks County Medical Society, Reading, Pa. (award for periodicals of county and city medical societies with a membership of less than 500). The awards are presented annually "for accuracy, clarity, conciseness and newness of information; for excellence of design, printing and illustrations."

Western Surgical Association.—The 66th annual meeting of the Western Surgical Association will be in Rochester, Minn., Nov. 20-22, with headquarters at the Hotel Kahler. At a pre-conference session Wednesday afternoon and evening, eight short papers will be presented by members of the Mayo Clinic staff. The clinico-pathologic conference will be at 7:30, and at 8:15 a regular meeting of the clinic staff especially arranged for this session. On Thursday beginning at 7:30 a. m. a chest conference will be followed by surgical clinics, and later surgical movies. In the afternoon 10 papers will be presented and on Friday 10 more and the presidential address by Dr. James B. Brown, St. Louis, on "Examples of the Inspiring Challenge to Medicine in Literature Through the Ages." Eight additional papers will be presented on Saturday.

Award for Essay on Thyroid Gland.—The American Goiter Association has again announced the offering of the Van Meter Prize Award of $300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association to be held in the Drake Hotel, Chicago, April 30-May 2, 1959. The competing essays may cover either clinical or research investigations, should not exceed 3,000 words, and must be in English. Duplicate typewritten copies, double spaced, should be sent to the Secretary, Dr. John C. McClintock, 149½ Washington Ave., Albany 10, N. Y., not later than Jan. 15, 1959. A place will be reserved on the program of the annual meeting for the presentation of the winning essay by the author.

Fellowships in Radiological Physics.—The Atomic Energy Commission is accepting applications for fellowships in radiological physics, which provide qualified graduate students with nine months of regular university graduate work in the sciences with three months of field training at an AEC installation. The assignments are made for study at Vanderbilt University, Nashville, Tenn., with field training at the Oak Ridge National Laboratory; at the University of Rochester (N. Y.) and Brookhaven National Laboratory; and at the University of Kansas, Kansas City, or the University of Washington, Seattle, and the Hanford Atomic Products Operation. The basic stipend is $2,500 a year plus $350 for each dependent. Tuition fees, and travel allowance are included under the fellowships. The Oak Ridge Institute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tenn., administers these fellowships for the AEC. The deadline for appointments that will take effect the following fall is Jan. 2, 1959.

Society News.—The **American Association for the Study of Neoplastic Diseases** (the original Bloodgood group of Johns Hopkins Hospital, organized in 1930) at its meeting in Gatlinburg, Tenn., elected Dr. Victor Levine, Chicago, president, and Dr. William E. G. Bayley, Lafayette, Ind., vice-president. The next meeting also will be in Gatlinburg, April 30-May 4, 1959, to which all physicians interested in the study of tumors are invited. Microscopes are used during the sessions. Gatlinburg is the headquarters of the Great Smoky Mountains National Park.——At the annual meeting of the **American College of Gastroenterology**, Oct. 19, in New Orleans, Dr. Frank J. Borrelli of New York, president-elect, assumed the presidency and Dr. Joseph Shaiken, Milwaukee, Wis., was chosen as president-elect. Other officers elected were: vice-presidents, Drs. Henry Baker, Boston; Louis Ochs Jr., New Orleans; Edward J. Krol, Chicago; and Theodore S. Heineken, Glen Ridge, N. J.; and Dr. Joseph R. Van Dyne, Forest Hills, N. Y., secretary.

Meeting of Speech and Hearing Association.—The 34th annual convention of the American Speech and Hearing Association will be at the Hotel New Yorker, New York City, on November 17-19. Among the subjects of the sessions will be a symposium on "Recoveries from Aphasia," "Cerebral Palsy," "Stuttering," "Audiologic Evaluation of Middle Ear Surgery," "Current Research on Hearing Aids," "Organic Disorders Affecting Voice and Articulation," "Cleft Palate," "Language Development of the Deaf Child," and "Planning and Design of Modern Clinical and Research Facilities." There will be alumni luncheons, open house, cocktail hour and dance Tuesday evening, and scientific and commercial exhibits.

On November 20 at the Hotel New Yorker there will be a conference on "Research Needs in Speech Pathology and Audiology," sponsored by the American Speech and Hearing Association in cooperation with the U. S. Office of Vocational Rehabilitation and Veterans Administration.

Influenza on Okinawa and in Oregon.—In its Oct. 17 *Morbidity and Mortality Weekly Report*, the U. S. Public Health Service reported that the Division of Preventive Medicine, Bureau of Medicine and Surgery, U. S. Department of the Navy, had received information regarding the occurrence of influenza in military personnel stationed on Okinawa. The outbreak which occurred about the middle of September involved men of four different companies. In two companies 5 men each were ill; 12 in another, and 31 in the fourth company. The main complaints were fever, headache, and dizziness. A few had "chest colds" and headache. The men returned to duty by the fifth day. There were no complications. A virus was isolated which was reported to be closely related to and probably identical with the Jap/305 strain of influenza type A.

The Oregon State Board of Health reports that the incidence of influenza continues to increase. Some serologic evidence of influenza A infection has been obtained, but the type of virus has not been definitely identified as yet.

Academy of Dermatology and Syphilology.—The 17th annual meeting of the American Academy of Dermatology and Syphilology will be at the Palmer House, Chicago, December 6-11. The annual meeting will include, as in other years, special courses, symposiums, panels, informal discussion groups, luncheons, dinners, and executive sessions, and committee meetings. Among the special events will be the first of the James R. Webster Memorial Lectures honoring the late president of the academy who passed away while in office last February. The lecture on Sunday afternoon will be delivered by Dr. G. A. Grant Peterkin, of the University of Edinburgh, Scotland, whose subject will be "The Changing Pattern of Dermatology." The subjects of other special lectures will be radiation and cancer. Dr. Howard B. Latourette, Ann Arbor, Michigan, will discuss "Radiation Hazards" and Dr. Anthony Cipollaro, New York City, "Current Trends in Cutaneous Radiation Therapy." The Women's Hospitality Committee has arranged special activities for the ladies including a sight-seeing tour, climaxed by luncheon in Chinatown, and a fashion show at the Congress Hotel.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Oct. 18, 1958 Paralytic Type	Oct. 18, 1958 Total Cases	Oct. 19, 1957 *Total*
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	1
Rhode Island	..	..	..
Connecticut	2	2	1
Middle Atlantic States			
New York	12	15	6
New Jersey	2	9	3
Pennsylvania	4	4	2
East North Central States			
Ohio	10	36	9
Indiana	3	8	5
Illinois	5	9	7
Michigan	20	66	15
Wisconsin	2	3	..
West North Central States			
Minnesota	3	3	1
Iowa	..	..	..
Missouri	3	6	1
North Dakota	..	1	..
South Dakota	..	..	..
Nebraska	..	2	..
Kansas	..	3	3
South Atlantic States			
Delaware	1	3	..
Maryland	3	3	3
District of Columbia	..	..	2
Virginia	10	11	5
West Virginia	7	10	2
North Carolina	1	4	3
South Carolina	1	1	..
Georgia	..	..	2
Florida	1	9	..
East South Central States			
Kentucky	1	2	3
Tennessee	4	8	5
Alabama	1	2	..
Mississippi	5	11	2
West South Central States			
Arkansas	1	1	..
Louisiana	3	4	4
Oklahoma	2	2	1
Texas	13	19	4
Mountain States			
Montana	..	..	..
Idaho	..	..	..
Wyoming	..	..	..
Colorado	..	..	2
New Mexico	..	2	1
Arizona	..	..	1
Utah	1	1	..
Nevada	..	..	..
Pacific States			
Washington	..	5	..
Oregon	..	1	..
California	19	23	17
Territories and Possessions			
Alaska	..	..	..
Hawaii	2	2	..
Puerto Rico	1	1	..
Total	143	292	111

LATIN AMERICA

Symposium on Cardiovascular Diseases.—An International Symposium on Cardiovascular Diseases will be held at Bogota, Colombia, South America, July 27-30, 1959, in which cardiologists from England, France, Sweden, Mexico, Cuba, and the United States will participate. The moderators of the several panels will be Drs. Adolfo De Francisco, Fernando Valencia, Alberto Castellanos, Jose Felix Patino, Alfonso Bonilla Naar, Miguel Trias, and Guillermo Rueda Montana. Among those from the United States scheduled to participate are Drs. Henry Swan II, Denver; John Maxwell Chamberlain, Mary Allen Engle, Charles E. Kossman, Joseph V. Brumlik, and Israel Steinberg, New York City; Richard J. Bing, St. Louis; Donald B. Effler, Cleveland; C. Walton Lillehei, Minneapolis; Michael E. DeBakey, Houston; Conrad R. Lam, Detroit; Dwight E. Harken, Robert E. Gross, and Alexander S. Nadas, Boston; Robert P. Glover, Philadelphia; Charles A. Hufnagel, Washington, D. C.; Francisco A. Hernandez, Miami; Frank L. Gerbode, San Francisco, and William W. L. Glenn, New Haven, Conn. Information may be obtained from Dr. Alberto Vejarano Laverde, Fundacion A. Shaio, Cra. 13, No. 43-23, Bogota, Colombia, South America.

CORRECTION

Medical Literature Abstracts.—In the paragraph on Medical Literature Abstracts on page 1040 of The Journal, Oct. 25, 1958 issue, the line which starts "Approximately two-thirds . . ." should have read "Approximately two-thirds of the abstracts from foreign literature are made from foreign language journals and one-third from publications of the British Commonwealth."

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least six weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications is Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

Alabama: *Written.* Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

Arizona:* *Written Examination and Reciprocity.* Phoenix, Jan. 14-16. Sec., Dr. Thomas H. Bate, 2910 North 7th Ave., Phoenix.

Alaska:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

California: *Oral Examination*, San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

Colorado: *Written.* Denver, Dec. 9-10. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

Connecticut:* *Homeopathic. Examination.* Derby, Jan. 13. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

Delaware: *Written Examination and Endorsement.* Dover, Jan. 13-15, Jan. 22. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

Florida:* *Examination.* Miami Beach, Nov. 23-25. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami 36.

Georgia: *Examination and Reciprocity.* Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

Guam: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

Idaho: *Examination and Endorsement.* Boise, Jan. 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

Illinois: *Examination and Reciprocity.* Chicago, Jan. 26-30. Supt. of Registration, Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

Iowa:* *Examination and Endorsement.* Des Moines, Dec. 8-10. Exec. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines 19.

Kentucky: *Examination.* Louisville, Dec. 8-10. Sec., Dr. Russell E. Teague, 620 South Third St., Louisville 2.

Maryland: *Examination.* Baltimore, Dec. 9-11. Sec., Dr. Frank K. Morris, 1211 Cathedral St., Baltimore 1.

Massachusetts: *Examination.* Boston, Jan. 13-16. Sec., Dr. Robert C. Cochrane, State House, Room 37, Boston 33.

Montana: *Examination and Reciprocity.* Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

Nebraska:* *Examination.* Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

Nevada:* *Examination and Reciprocity.* Reno, Dec. 2. Sec., Dr. George H. Ross, 112 North Curry St., Carson City.

New Hampshire: *Examination and Endorsement.* Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

New York: *Examination.* Albany, Buffalo, New York and Syracuse, Dec. 2-5. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

North Carolina: *Reciprocity.* Southern Pines, Jan. 17. *Examination.* June. Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

North Dakota: *Examination and Reciprocity.* Grand Forks, Jan. 7-10. Sec., Dr. C. J. Glaspel, Grafton.

Ohio: *Examination.* Columbus, Dec. 16-18. *Endorsement.* Columbus, Dec. 16-18. Sec., Dr. H. M. Platter, Wyandotte Bldg., Columbus 15.

Oklahoma:* *Examination.* Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

Oregon:* *Examination.* Portland, Jan. 6-7. *Reciprocity.* Portland, Jan. 8-10. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

Pennsylvania: *Endorsement.* Harrisburg, Dec. 11-12. *Examination.* Philadelphia, Jan. 7-10. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

Rhode Island:* *Examination.* Providence, Jan. 8-9. Admin., Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

South Carolina: *Endorsement.* Columbia, Dec. 9. Sec., Dr. H. E. Jervey, Jr., Blanding Bldg., Columbia.

South Dakota:* *Examination.* Sioux Falls, Jan. 20-21. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

Tennessee:* *Examination.* Memphis, Dec. 17-18. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis 3.

Texas:* *Examination and Reciprocity.* Fort Worth, Dec. 4-6. Sec., Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth 2.

Utah: *Examination.* Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

Virginia: *Examination and Reciprocity.* Richmond, Dec. 4-6. Address: Virginia Board of Medical Examiners, 631 First St., S. W., Roanoke.

Washington:* *Examination.* Seattle, Jan. 12-14. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

West Virginia: *Examination and Reciprocity.* Charleston, Jan. 5-7. Sec., Dr. Newman H. Dyer, State Office Bldg. No. 3, Charleston 5.

Wisconsin:* *Examination and Reciprocity.* Madison, Jan. 13-15. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., 1 West Wilson St., Madison.

Wyoming: *Examination and Reciprocity.* Cheyenne, Feb. 2. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Arizona: *Examination.* Tucson, Dec. 16. Sec., Mr. Herman E. Bateman, University of Arizona, Tucson.

Colorado: *Examination and Reciprocity.* Denver, Dec. 3-4. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

Connecticut: *Examination.* New Haven, Feb. 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

Florida: *Examination.* Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

Iowa: *Examination.* Des Moines, Jan. 13. Sec., Dr. Elmer W. Hertel, Wartburg College, Waverly.

Kansas: *Endorsement.* Kansas City, Jan. 14. *Examination.* Kansas City, Jan. 16-17. Sec., State Board of Healing Arts, Dr. F. J. Nash, New Brotherhood Bldg., Kansas City.

Michigan: *Examination.* Ann Arbor and Detroit, Feb. 12-13. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., West Michigan Ave., Lansing.

Minnesota: *Examination.* Minneapolis, Jan. 6-7. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

New Mexico: *Examination.* Santa Fe, Jan. 18. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

Oklahoma: *Examination.* Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

Oregon: *Examination.* Portland, Dec. 6. Sec., Dr. Earl M. Pallett, Box 5175, Eugene.

Rhode Island: *Examination.* Providence, Nov. 19. Admin. of Professional Regulation, 366 State Office Bldg., Providence.

South Dakota: *Examination.* Vermillion, Dec. 5-6. Sec., Dr. Gregg M. Evans, 310 East 15th St., Yankton.

Tennessee: *Examination.* Memphis, Dec. 31-Jan. 1. Sec., Dr. O. W. Hyman, 62 South Dunlap St., Memphis 3.

Texas: *Examination.* April 1959. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

Washington: *Examination.* Seattle, Jan. 7-8. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

Wisconsin: *Examination.* Milwaukee, Dec. 6, Madison, Apr. 4. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

---

*Basic Science Certificate required.

DEATHS

Auerbach, Julius Ⓜ Chicago; Chicago College of Medicine and Surgery, 1913; on the staff of the Walther Memorial Hospital; died while on a vacation in Sturgeon Bay, Wis., Sept. 27, aged 75.

Baldwin, Janet Sterling Ⓜ New York City; born in Lakewood, N. J., June 4, 1908; Johns Hopkins University School of Medicine, Baltimore, 1935; certified by the National Board of Medical Examiners; specialist certified by the American Board of Pediatrics; member of the American Pediatric Society and the American Academy of Pediatrics; associate professor of pediatrics at the New York University College of Medicine; member of the board of directors of the New York Heart Association; associated with the University, Bellevue, and Lenox Hill hospitals; died in the Presbyterian Hospital Sept. 17, aged 50, of cancer of the thyroid with cervical metastases.

Bender, Alva Jacob Ⓜ Salida, Colo.; Rush Medical College, Chicago, 1909; served on the faculty of his alma mater; a member of the board of education and county health officer; veteran of World War I; formerly on the staff of the Denver and Rio Grande Western Hospital, where he died Aug. 29, aged 83.

Bland, James Moncure, Boykins, Va.; Medical College of Virginia, Richmond, 1905; chairman of the Southampton County Board of Supervisors; killed Sept. 11, aged 76, in an automobile accident.

Bonnell, George Harrison Ⓜ Worthington, Ohio; Starling Medical College, Columbus, 1906; for many years member of the school board of which he was past-president; died Sept. 12, aged 77, of pulmonary emphysema.

Brown, William Lee Sr. Ⓜ Tucson, Ariz.; Rush Medical College, Chicago, 1916; formerly practiced in Chicago where he was associated with St. Luke's and Chicago Memorial hospitals; member of the Illinois State Medical Society; specialist certified by the American Board of Radiology; veteran of World War I; died in St. Mary's Hospital Sept. 10, aged 70.

Bullock, Norman Charles, La Jolla, Calif.; University of Illinois College of Medicine, Chicago, 1927; formerly practiced in Rockford, Ill., where he was health commissioner, past-president of the Winnebago County (Ill.) Medical Society and president of the board of trustees of the Rockford Municipal Tuberculosis Sanatorium; veteran of World War II; a member of the county health department; died in San Diego Aug. 31, aged 58, of pulmonary emphysema and cor pulmonale.

Burton, William Stone, Louisville, Ky.; Medical College of Virginia, Richmond, 1937; served as medical superintendent of the District Six Tuberculosis Hospital in Glasgow and on the staff of the W. T. Edwards Tuberculosis Hospital in Tallahassee, Fla.; consultant at the Hazlewood Sanatorium; died Aug. 15, aged 44, of cancer.

Crotty, Nora Ⓜ Cincinnati; Cincinnati College of Medicine and Surgery, 1902; four times elected vice-president of the Cincinnati Academy of Medicine; died Sept. 14, aged 88.

Davidson, Walter E. Ⓜ Liberty, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; served as a member of the board of health of Adams County; died in the Blessing Hospital, Quincy, Sept. 2, aged 82.

Davis, William T. Ⓜ Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1911; past-president and secretary of the Lackawanna County Medical Society; served on the staff of the American Red Cross; formerly health director of Lackawanna County; at one time chief medical officer of the Lackawanna Railroad; formerly chief of medical service at Moses Taylor Hospital, where he died Sept. 23, aged 73.

Dillen, Oscar Marion, Lufkin, Texas; University of Tennessee College of Medicine, Memphis, 1915; veteran of World War I; on the staff of the Memorial Hospital and Angelina County Hospital, died Sept. 4, aged 72, of cerebrovascular accident.

Ferree, Arthur Cruzon Ⓜ Buena Park, Calif.; University of California School of Medicine, San Francisco, 1943; member of the American Academy of General Practice; veteran of World War II and served in France and Germany with the 6th Army as a battalion surgeon winning the Bronze Star for gallantry in directing evacuation of 275th Infantry wounded under fire; served on the staffs of St. Jude Hospital in Fullerton, St. Joseph Hospital in Orange, Santa Ana (Calif.) Community Hospital, Whittier Memorial and Carobil Hospital at Norwalk; died Sept. 4, aged 40, of myocardial infarction.

Finsterwald, Charles Frederick, San Antonio, Texas; Ohio State University College of Medicine, Columbus, 1916; died in Naples, Fla., July 28, aged 73, of coronary occlusion.

Ⓜ Indicates Member of the American Medical Association.

Fort, Chester Arthur Jr. Ⓜ Jacksonville, Fla.; born in Ocala, Oct. 11, 1910; Tulane University School of Medicine, New Orleans, 1936; specialist certified by the American Board of Urology; member of the Southeastern Surgical Congress and the American Urological Association; fellow of the American College of Surgeons; formerly on the faculty of Emory University School of Medicine in Atlanta, Ga.; served during World War II; on the staffs of St. Vincent's, St. Luke's, Riverside and Brewster hospitals, and Duval Medical Center; died near Melrose Sept. 1, aged 47, while on a fishing trip.

Fulton, James Fairfax, Staunton, Va.; Medical College of Virginia, Richmond, 1919; member of the American Psychiatric Association; served as health officer; chief of the male service, Western State Hospital; died in the King's Daughters Hospital Sept. 5, aged 64, of myocardial infarction.

Galloway, Philip Lee, Glendale, Calif.; University of Kansas School of Medicine, Kansas City, 1944; veteran of World War II; on the staff of the Queen of Angels Hospital, Los Angeles; died Sept. 7, aged 38, of a heart attack.

Gazzolo, Louis Joseph Ⓜ Chicago; Chicago Medical School, 1945; member of the Industrial Medical Association; formerly health officer with the Chicago Board of Health; veteran of the Korean War; associated with the Lewis A. Weiss Memorial Hospital and the Michael Reese Hospital, where he died Sept. 17, aged 45, of acute myocardial infarction.

Gilbert, William Paul Ⓜ San Francisco; College of Medical Evangelists, Loma Linda and Los Angeles, 1937; certified by the National Board of Examiners; member of the American Academy of General Practice; died in the Mount Zion Hospital Aug. 7, aged 55, of coronary occlusion.

Graves, John William Ⓜ Indianapolis; Indiana University School of Medicine, Indianapolis, 1927; veteran of World War II; for many years on the faculty of Indiana University School of Dentistry and taught for two years at the Indiana College of Mortuary Science; author of textbooks and laboratory manuals; died Sept. 6, aged 57.

Gunn, William Ussery, Clinton, S. C.; University of Louisville (Ky.) School of Medicine, 1949; clinical director at Whitten Village; died in the Self Memorial Hospital, Greenwood Sept. 16, aged 38, of atelectasis of lungs and bilateral and bronchopneumonia.

Hackler, John Fielden Ⓜ Muskogee, Okla.; born in Tahlequah, Dec. 11, 1910; University of Oklahoma School of Medicine, Oklahoma City, 1933; specialist certified by the American Board of Preventive Medicine; entered the public health field Sept. 1, 1936 as director of the Payne County Health Department in Stillwater, Okla.; in 1940 became director of the field advisory staff of the Oklahoma State Board of Health, serving until 1943, and for 12 years served as chairman of the records committee; visiting lecturer in preventive medicine and public health and first full-time chairman and professor of preventive medicine and public health at his alma mater from 1943 to 1948, when he was appointed director of the city-county health unit; served as secretary of the Payne County Medical Society; charter member of the American Association of Public Health Physicians; was a member of the board of directors of the Oklahoma division of the American Cancer Society; for several years on the board of directors of the Oklahoma Congress of Parents and Teachers, serving as chairman of community health; author of articles in the field of preventive medicine and public health; died Sept. 3, aged 47, of rheumatic heart disease with aortic insufficiency and mitral stenosis.

Haines, Harold Grunder Ⓜ Berlin, Pa.; University of Pittsburgh School of Medicine, 1920; associated with Somerset (Pa.) Community Hospital; president of the Berlin Lions Club; died Sept. 16, aged 63, of third degree burns received in a fire following an explosion in his home.

Hanson, Charles Joseph, Easthampton, Mass.; Baltimore Medical College, 1904; served as school physician, a member of the school committee, medical examiner for the Second Hampshire District, and as agent of the board of health; health officer of Easthampton; died in the Cooley Dickinson Hospital, Northampton, Aug. 31,aged 76.

Jennings, Edward Allen, New York City; Columbia University College of Physicians and Surgeons, New York City, 1913; member of the Medical Society of the State of New York; served on the staffs of the Harlem, Fordham, and St. Luke's hospitals; died Sept. 10, aged 76, of cerebral hemorrhage.

Kaplan, Murray M., Boston; Eastern University School of Medicine, Baltimore, 1913; died Sept. 5, aged 68.

Kiebala, Joseph Kasmer, Buffalo; University of Buffalo School of Medicine, 1913; member of the Medical Society of the State of New York; died Sept. 1, aged 66.

Lusher, Homer Virgil Ⓜ Huntington, W. Va.; Medical College of Ohio, Cincinnati, 1906; died Sept. 12, aged 76.

McCandless, Orville Calnon Ⓜ Cheyenne, Wyo.; Washington University School of Medicine, St. Louis, 1925; veteran of World War I; Laramie county health officer; served as health officer of Marion County, Kan.; died in the Veterans' Administration Hospital Sept. 12, aged 63, of coronary thrombosis.

McClure, Charles Richard Ⓜ Portland, Ore.; Medical College of Ohio, Cincinnati, 1901; professor emeritus of orthopedic surgery at the University of Oregon Medical School; member of the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; for many years served as examiner for the Oregon Industrial Accident Commission; served on the staffs of the Doernbecher Memorial Hospital for Children, Multnomah County Hospital, and Shriners' Hospital for Crippled Children; died Sept. 4, aged 81.

McMeans, Joseph William Ⓜ Anderson, S. C.; born in Toledo, Ohio, Jan. 25, 1891; University of Pittsburgh School of Medicine, 1912; specialist certified by the American Board of Pathology; member of the American Association of Pathologists and Bacteriologists, College of American Pathologists, and the American Society of Clinical Pathologists; fellow of the American College of Physicians; for many years practiced in Pittsburgh, where he was chief coroner's pathologist in Allegheny County, and served on the staff of Pittsburgh Hospital; formerly pathologist at the Allegheny Valley Hospital in Tarentum; pathologist at Anderson Memorial Hospital; died Sept. 2, aged 67, of dissecting aneurysm of the aorta.

Maley, Thomas Francis Ⓜ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1924; died Sept. 12, aged 60.

Martin, James Jackson, Dawson, Ga.; Atlanta College of Physicians and Surgeons, 1913; an associate member of the American Medical Association; veteran of World War I; died in the Patterson Hospital, Cuthbert, Aug. 30, aged 68.

Mintz, Maurice Emanuel, New York City; University and Bellevue Hospital Medical College, New York City, 1909; member of the Medical Society of the State of New York; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; on the staffs of the Mount Sinai Hospital and Sydenham Hospital; died Sept. 10, aged 72.

Murdoch, James Wilson Ⓜ Chapel Hill, N. C.; University of Aberdeen Faculty of Medicine, Scotland, 1924; member of the American Psychiatric Association; served as medical superintendent of the North Carolina State Hospital in Butner; died in the Memorial Hospital Sept. 16, aged 58, of cerebral hemorrhage and hypertensive cardiovascular disease.

Myers, Roy Everett Ⓜ Joplin, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1916; past-president of the Jasper County Medical Society; associated with Freeman Hospital and St. John's Hospital, where he died Sept. 4, aged 68, of coronary disease.

Nevitt, Orme Richardson Ⓜ Raymond, Wash.; born in 1878; University of Minnesota College of Medicine and Surgery, Minneapolis, 1900; member of the American Academy of General Practice; past-president of the Pacific County Medical Society; helped organize the Pacific County Tuberculosis League of which he was president; served as health officer; in 1951 was named "Washington General Practitioner of the Year" by the state medical association; associated with the work of the American Red Cross for more than 50 years, serving many terms as county chapter chairman and was chairman emeritus at the time of his death; district registrar of vital statistics for many years; the Nevitt Memorial swimming pool, was built and dedicated in honor of his service to Raymond and the surrounding community; on the staff of the Willapa Harbor Hospital in South Bend, where he died Sept. 6, aged 79, of cancer.

Olms, Frank Albert, St. Petersburg, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; for many years practiced in Hampshire, Ill.; served on the staffs of the St. Joseph and Sherman hospitals in Elgin, Ill.; died Sept. 6, aged 83, of heart disease and pneumonia.

Pence, James William, Columbus Junction, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1907; served as medical examiner for the Rock Island Railroad; from 1941 to 1947 medical examiner for the Louisa County Draft Board; served as county coroner; died in the Bellevue Hospital, Muscatine, Aug. 30, aged 79, of diabetes mellitus.

Predmore, Donald Ford, Montrose, Calif.; College of Medical Evangelists, Loma Linda and Los Angeles, 1934; died Sept. 5, aged 50.

Prevor, Morris Aaron, Brooklyn; St. Louis University School of Medicine, 1929; member of the Medical Society of the State of New York; died in the Brooklyn State Hospital Aug. 14, aged 54, of cerebrovascular accident and arteriosclerosis.

Quattlebaum, Theodore Adolphus, Winnsboro, S. C.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; served as superintendent of the Carolina Orphan Home, Columbia, and the Croswell Home in Sumter; died in the Baptist Hospital, Columbia, Aug. 24, aged 82.

Reitz, Charles, Rochester, N. Y.; Bellevue Hospital Medical College, New York City, 1890; an associate member of the American Medical Association; on the staff of the Park Avenue Hospital; died Sept. 3, aged 91, of coronary occlusion.

Riley, James Horatio, Westport, Conn.; Starling-Ohio Medical College, Columbus, 1912; member of the Ohio State Medical Association; veteran of World War I; served on the staffs of the Mercy and Springfield hospitals in Springfield, Ohio; died in Norwalk, Conn., Sept. 7, aged 69, of cerebral hemorrhage.

Schnaer, Carl Henry, Chicago; Chicago College of Medicine and Surgery, 1916; served on the staffs of the German Evangelical Deaconess Hospital and Englewood Hospital; died in the Veterans Administration Research Hospital Sept. 24, aged 73, of heart disease.

Schwarz, Francis Stenard Jr., Ⓜ Cleveland; Cornell University Medical College, New York City, 1943; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; formerly associated with the U. S. Public Health Service; on the staffs of the St. Vincent Charity and St. Luke's hospitals; died in Medina, Ohio, Aug. 31, aged 37, of injuries received in an automobile accident.

Sewell, Harry Dickey, Rochester, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1909; an associate member of the American Medical Association; fellow of the American College of Physicians; associated with the Veterans Administration; formerly member of the medical division of Eastman Kodak Company; died in the Veterans Administration Hospital, Boston, Aug. 25, aged 75, of cancer.

Sherer, William Walter, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1906; died in the Parkview Hospital Aug. 29, aged 79, of cancer of the pancreas.

Shirk, Paul Kuhlmann, Watervliet, N. Y.; Jefferson Medical College of Philadelphia, 1930; formerly practiced in Yonkers, where he was on the staff of the St. John's Riverside Hospital; medical rating specialist and personnel physician at the Veterans Administration office at the Watervliet Arsenal; died Aug. 27, aged 64.

Soucek, Adolph Ⓜ Madison, Wis.; State University of Iowa College of Medicine, Iowa City, 1931; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; served as assistant physician at the State Hospital and School, Woodward, Iowa, assistant superintendent of the Cherokee (Iowa) State Hospital, superintendent of the Mount Pleasant (Iowa) State Hospital, and assistant superintendent of the Mendota State Hospital; died Aug. 30, aged 51, of cryptococcosis.

Spain, A. L., Ⓜ Letona, Ark. (licensed in Arkansas in 1903); died Aug. 23, aged 85.

Spratt, John Thomas Ⓜ Mingus, Texas; Dallas Medical College, 1902; for many years surgeon for the Texas and Pacific Railway; died in Strawn (Texas) Hospital Sept. 3, aged 83, of third degree burns received while burning trash.

Stahl, Clare William, Topeka, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1904; veteran of the Spanish-American War; died Aug. 31, aged 80, of cancer of the esophagus.

Styles, George Wilson, Miami, Fla.; Meharry Medical College, Nashville, Tenn., 1948; died June 4, aged 45, of cerebral hemorrhage, hypertension and arteriosclerosis.

Terflinger, Fred Weston Ⓜ Logansport, Ind.; Medical College of Indiana, Indianapolis, 1902; veteran of World War I; served as superintendent of the Logansport State Hospital; a charter member and past-president of the Rotary Club; died in St. Joseph's Hospital Sept. 5, aged 84.

Treible, William Henry, St. Petersburg, Fla.; Jefferson Medical College of Philadelphia, 1896; an associate member of the American Medical Association; formerly practiced in York, Pa., where he was associated with the York Hospital; died Aug. 22, aged 92, of cerebral thrombosis.

Welsh, Arthur Brinkley Ⓜ Colonel, U. S. Army, retired, Newton Square, Pa.; University of Pittsburgh School of Medicine, 1925; entered the medical corps of the U. S. Army July 12, 1926, and retired Oct. 31, 1954; awarded the Legion of Merit for conspicuous and meritorious service in the Army from November 1941 to May 1945; service member of the American Medical Association; died in Harrisburg Sept. 4, aged 57, of coronary occlusion.

Westrope, Gordon Robert Ⓜ Columbia, S. C.; Medical College of South Carolina, Charleston, 1927; member of the American Psychiatric Association; veteran of World War I; formerly practiced in Gaffney, and served as district health director and director of the Cherokee County Health Department; for many years associated with the South Carolina State Hospital; died Aug. 25, aged 65.

Williams, Edwin Lacy, Fort Meade, Fla.; Atlanta College of Physicians and Surgeons, 1904; died June 1, aged 85, of arteriosclerotic heart disease and hypertension.

Williams, Paul Sinclair, Santa Cruz, Calif.; Western Reserve University School of Medicine, Cleveland, 1931; died Aug. 27, aged 52.

Wilson, Claude Ⓜ Greenville, Ky.; University of Louisville (Ky.) Medical Department, 1910; veteran of World War I; on the staff of the Muhlenburg Community Hospital; died Aug. 21, aged 78.

Zachariah, Simon R., San Francisco; College of Physicians and Surgeons, San Francisco, 1900; served with the British Army during World War I; died Sept. 7, aged 80.

FOREIGN LETTERS

INDIA

Scurvy.—A. Chakravarty and co-workers (*Indian J. Child Health* 7:8 [Aug.] 1958) stated that while protein malnutrition, rickets, hypovitaminosis A and B, and anemia are common, the incidence of scurvy in India is believed to be low, but they observed 28 cases of scurvy in a period of 17 months. The number of patients diagnosed as having scurvy was much larger, but the diagnosis could not be confirmed because these patients were lost sight of. Most were boys, with the preponderance being between the ages 2 and 3 years, and the largest number of patients were seen between October and January. Most of them came from poor families, and their diet was deficient in calories and vitamins. The diet contained an insignificant quantity of pulses and milk, while fruits were uniformly absent. A history of a preceding illness was available in 21 patients, the most common being fever of undetermined origin and upper respiratory tract infection. The onset was acute in 24 and insidious in four.

The common clinical findings were tenderness over the lower limbs and pseudoparalysis with inability to bear weight. In eight the tenderness was severe enough to make the child cry when the limbs were touched. Pseudoparalysis was unilateral in nine. Most of the children were irritable. Mild to moderate anemia was present in almost all patients, but frank bleeding from the gums was found in only five. One girl of 6 years came to the hospital with generalized hemorrhages and pseudoparalysis, rapidly developed coma, and died, probably of a subarachnoid hemorrhage. There were no other deaths. Seven showed evidence of multiple vitamin deficiencies. A mild polymorphonuclear leukocytosis was seen in 14. Bone marrow biopsy was done in seven patients; six of these had a normoblastic and one a megaloblastic appearance. The Kahn test was done in two of those below the age of 2 years to rule out congenital syphilis and was found to be negative.

Radiologically, the commonest sign was the white line of Fränkel, associated with a zone of rarefaction below it. One patient had subperiosteal calcification. During the process of healing the Trummerfield's zone of rarefaction was the first to disappear, trabeculas appeared, and the effusion in the joints gradually diminished. The vitamin C content of the blood was estimated, and it was noticed that those with a content of less than 0.1 mg. per 100 ml. had frank hemorrhages. The highest level of vitamin C in the blood associated with the presence of bleeding gums was 0.22 mg. per 100 ml. In 18 a close correlation between the blood level of vitamin C and the severity of symptoms was noted. These patients were given 200 to 500 mg. of vitamin C daily by mouth, the dose depending on the severity of the condition. Diminution in tenderness, pain, and irritability was noticed within 72 hours, and full return to normal weight bearing was possible in early cases after 7 to 14 days of treatment. Two patients responded very slowly to therapy. The blood vitamin C level took about two weeks to show a rise and returned to normal within 3 to 12 weeks.

NEW ZEALAND

Van Meter Prize.—Dr. Duncan D. Adams has been awarded the American Goiter Association's Van Meter prize. This prize is given annually for the best research on the thyroid gland anywhere in the world. Dr. Adams is on the staff of the endocrinology research unit of the New Zealand Medical Research Council. He gained the prize for his work in connection with toxic goiter. In collaboration with Dr. H. D. Purves he developed a method of detecting and measuring thyroid-stimulating hormones. Application of this method led to the discovery that patients suffering from the disease have an abnormal thyroid-stimulating hormone in their blood. The discovery has since been confirmed by American scientists. It has led to a new line of investigation which promised to reveal the basic cause of the disease.

Health Service Reviewed.—Dr. J. P. S. Jamieson (*Brit. M. J.* [supp.] 2:15 [July 5] 1958) reported that to understand the social security medical services in New Zealand it is necessary to review the system which existed before their introduction. Public hospitals, financed by local taxes, government subsidy, patients' fees, and voluntary contributions, and administered by local boards, served all parts. Most wage earners paid for themselves. The poor were assisted by hospital boards and relied largely on the benevolent services of the doctors. During the depression of the 1930's, it became evident that a greater participation by the state in health matters was inevitable. A committee was set up to examine the needs of the country and to in-

---

The items in these letters are contributed by regular correspondents in the various foreign countries.

quire into the systems of other countries. The committee advised (1) a gradual introduction of the service and emphasized prevention of and research on diseases, (2) greater access to x-ray examination, laboratory and pathological investigation, and other costly procedures, (3) free service for those unable to pay for medical care, the cost to be borne by the state, (4) reduced costs for maternity care and hospitalization, and (5) insurance of those with smaller incomes against sickness in the home on a contributory-subsidized basis.

The government, however, inclined toward a universal revolutionary system, by which, in keeping with the ideology of state ownership and control, all medical service would be entirely under the government and all physicians would become virtually state employees. After various unacceptable proposals by the government, the New Zealand Branch of the British Medical Association considered a fee-for-service system at $1.10 for consultation or visit and $2 for consultation or visit at night and on Sundays and holidays and mileage for country visits. During World War II this became law. The branch saw in this the danger of the state interposing between patient and doctor and ultimate domination of the profession. At this point, the Prime Minister intervened with the proposal of an alternative to the fee-for-service claim on the fund by the general practitioner. He suggested that those who preferred might charge the patient himself such fees as he thought fit, and the patient could obtain, on presentation of his receipted account, a refund equal to the fee-for-service payment. By this method the state did not come between physician and patient, the patient-doctor relationship was preserved, and the physician would not be in any sense a government servant in his practice.

Provision was also made on a salary basis for the service of certain small isolated communities and for people living in scattered districts in which a physician ordinarily could not make a living. There are specialists on the staff of the free hospitals, and the patients of private specialists get the ordinary refund on their accounts for each attendance. Later, radiological, diagnostic, laboratory, and pathological services were established. Briefly, medical services are now available "free" to everyone from birth till death—"free," but paid for by taxation. The cost of the general practitioner, however, absorbs but a fraction more than 12 of the 18 cents social security tax. Medical service is efficient. People are living longer. Maternal mortality is one of the lowest in the world. Neonatal deaths have diminished. Rehabilitation for invalidism is quicker than it used to be. Doctors are fully employed and can practice wherever they choose. There are some weaknesses in the system; there is undue reference of patients to hospital for things the physician should do for himself; there is waste of drugs; and in some cases there is a tendency to exploit the fund by overattendance; but on the whole it is satisfactory.

NORWAY

Causes of Death.—When a woman of 70 with a history of rheumatic fever in childhood, angina pectoris in later years, and a possible infarct is found on examination to present a systolic murmur over the apex, a bundle-branch block on an electrocardiographic examination, marked systolic and diastolic hypertension, chronic bronchitis, and emphysema, how is her death certificate to be worded? With this and kindred problems in his mind, Prof. H. J. Ustvedt (*Tidsskrift for den norske lægeforening*, Sept. 1, 1958) set the staff of his side of Ullevaal Hospital the task of analyzing, in terms of death certificates, records of the 118 patients discharged in June, 1957. Half of this number were over the age of 60, and only 10% were under 40. None was under 20. Each of five members of his staff listed these patient's ailments independently of each other. In only 18 cases did they agree on which were the principal diseases and which were complications or accessory. In 32 cases there was a relative agreement, all being credited with the same diseases, but not necessarily in the same order of importance. By adding these 32 to the 18 already mentioned, it could be claimed that approximate agreement had been achieved in only 42% of the total. A substantial degree of disagreement was noted in particular with regard to atherosclerotic, rheumatic, hypertensive, and other forms of heart disease. Commenting on these findings, Ustvedt confessed that, far from solving any problem, they raise a whole series of questions, calling for uniformity of diagnostic criteria, uniformity of nomenclature, and some coordination within hospitals over material for statistical handling.

Rheumatic Fever.—Höst and Ustvedt (*Tidsskrift for den norske lægerforening*, Sept. 15, 1958) used a modification of the Duckett Jones system of criteria for the diagnosis of rheumatic fever in an attempt to ascertain what changes this disease may have undergone in the recent past. The 174 cases observed at Ullevaal Hospital in the three-year period 1931-1933 were compared with the 121 cases in the five-year period 1952-1956. The hospital records of each of these 295 cases was critically scrutinized with regard to the diagnostic criteria used. There was complete agreement with the Jones criteria in 86% of the first and 81% of the second group. In both groups it would thus seem that the diagnoses had, on the whole, reflected discriminating accuracy. To judge by this comparison the disease has shifted in character, with fewer severe cases with involvement of the heart and fewer relapses. While in the first group the sexes were equally represented, females predominated in the second group in the ratio of 3:2. Patients under 20 years of age were equally represented in the two groups, but whereas only 7% of the patients in the first group were over 50, this was the case with 27% in the second group. In a retrospect of earlier publications on the subject, it is pointed out that opinions as to the decline in the frequency and severity of rheumatic fever have been unavoidably vague for want of straightforward criteria which render a disease like pernicious anemia amenable to accurate diagnosis. At present, the closest approach to accuracy is by such a system of criteria as that used by Duckett Jones.

The State Institute of Public Health.—With its staff of 14 physicians, 8 pharmacists, and a budget running into many millions, the State Institute of Public Health in Oslo is now so much taken for granted that there is risk of the services it renders to the community being overlooked—hence the importance of its annual report for 1957 (supplement to *Tidsskrift for den norske lægeforening,* Aug. 15, 1958). Most of the bacterial vaccines, toxoids, and serums needed in Norway are produced by the institute's serum department. Those vaccines that have to be imported from abroad include that for poliomyelitis which is imported from Denmark and the United States and small quantities of certain typhus, plague, and yellow fever vaccines. The cowpox vaccine department is the sole producer of cowpox vaccine in Norway. Attempts are being made to reduce the bacterial content of the calf vaccine and to increase the stability of cowpox vaccine grown on tissue cultures. In 1957 a case of postvaccinal encephalitis with recovery was reported. There is also the bacteriological department which carries out bacteriologic and serologic tests. In 1957 there were 47,787 specimens examined for tubercle bacilli. The serodiagnosis department includes a Wassermann laboratory which in 1957 examined 83,741 specimens for the diagnosis of syphilis by complement fixation and flocculation tests. Another laboratory dealt with influenza problems, including those raised by the epidemic in the last four months of 1957. Another unit is the chemistry department which is concerned with chemical investigations of drinking water and sewage. In 1957 the methodology department was created. It deals with special problems in the fields of microbiology and biochemistry.

Shortage of Radiologists.—At the end of last year about 50% of the hospital posts for radiologists were vacant for want of applicants. This illustrates the working of the law of demand and supply, but it must be carefully explained to the public hospital authorities who have not hitherto fully appreciated what it costs to become a radiologist. As pointed out by Dr. O. Grönvik, chairman of the Junior Physicians Association, the physician who has graduated as such must take six to seven additional years in order to qualify as a fully trained radiologist, having under the best of circumstances to spend four of these years in the radiological department of a hospital. The health authorities have decided that the radiologist must not exceed a 40-hour week on account of the dangers inherent to his work, but in practice no Norwegian radiologist keeps within this limit, such is the call on his services. Even when a young radiologist becomes qualified for one of the relatively few high appointments, he may hesitate before accepting it for fear of finding himself swamped by work for which he has no assistant. Something could be done to encourage the recruiting of junior radiologists by allowing them certain emoluments hitherto denied them in certain hospitals. Although the practice of such hospitals to pay the surgeon called on to deal with a casualty brought to hospital but to pocket the corresponding fee charged the patient for the services of radiologist working in cooperation with the surgeon has led to disputes, it is not so much a matter of fees in isolated instances as the long-term future of the would-be radiologist that is making him hesitate in his choice of calling. Because it takes so long to become a radiologist, there is little prospect of the present stalemate being corrected in the near future.

SWITZERLAND

Iproniazid and Angina Pectoris.—Schweizer and von Panta (*Schweiz. med. Wchnschr.* 88:822, 1958) gave 150 mg. a day of iproniazid to 100 ambulatory patients with angina pectoris for 12 to 222 days. The pain on effort disappeared in 48 patients and was improved in 49. In three the drug had no effect; 63 were completely and 29 partially relieved from pain at rest. Improvement was noted after an average of 7 (2 to 18) days. The optimal therapeutic effect was reached before the 20th day and remained constant during the trial period in 98 patients. After the drug had been discontinued, pain reappeared in 74 within 10 to 20 days. The electrocardiogram at rest remained unchanged in 57 patients; the ischemic changes decreased in 30 and increased in 13. The arterial pressure was diminished in 25% of the normotensive and in 73% of the hypertensive patients. In 40% there was an orthostatic hypotension. A decrease of the hypotensive effect of iproniazid during the trial period was observed in 36 patients. Serious complications occurred in 14 patients: myocardial infarction in 4, cerebrovascular accident in 2, congestive heart failure in 4, urinary retention in 2, and psychosis in 2. Three patients died, two with myocardial infarction and one with cerebrovascular accident.

Such undesirable side-effects as impotence, insomnia, and constipation were observed in 89 patients. These side-effects made it necessary to cease the trial in 46. In most of these patients the drug had a marked effect on the pain. Unfortunately the side-effects prohibited the administration of an effective dosage over a prolonged period of time in about half the patients. In most, the effective dosage was 150 mg. a day. It cannot yet be stated whether or not a drug tolerance develops. There are no indications that iproniazid has any effect on the myocardial ischemia or on the natural course of the disease. On the other hand the disappearance of the signal pain has not been proved to be harmful. The danger of serious complications necessitates careful observation of the patient. In the presence of cerebral arteriosclerosis or of a marked increase of the size of the heart, the administration of iproniazid is not advisable.

UNITED KINGDOM

Public's Views on Cancer.—The public's views on the cause of cancer were obtained through interviews with a random sample of the adult population of Edinburgh by Cartwright and Martin (*Brit. M. J.* 2:592, 1958). Only 1% of those questioned knew that cancer could attack children. Between 25 and 33% considered it primarily a disease of persons above the age of 45. There were no indications of cancerophobia in the population at large. When asked which of five selected causes of death was responsible for the greater number of deaths in the population, 35% said heart disease, 32% said traffic accidents, and 27% said cancer. Women were more cancer-conscious than men. Of those questioned, 75% thought that cancer was ultimately fatal, and more than 33% said that they would rather not know if they had cancer. It is now quite widely believed that smoking is a cause of cancer. When asked specifically, 30% said that smoking was a possible cause. The cause of cancer most frequently suggested was knocks, bumps, or bruises. Then in descending order of frequency came smoking, air pollution, inheritance, fatigue, worry, and "overstrain." No opinion on the cause of cancer was given by 34%, and 12% thought that it was communicable. Curiously enough, the number of people who gave up smoking on the grounds of expense was greater than those who gave it up for health reasons.

Psychological Medicine in General Practice.—A working party of the Council of the College of General Practitioners studied psychological medicine in general practice at the request of the Ministry of Health (*Brit. M. J.* 2:585, 1958). They found that psychological medicine was an integral part of all general practice. Every good family physician must be a good psychologist. To misdiagnose psychological illness is just as bad as misdiagnosing organic disease and may lead to even greater unhappiness. So much medical teaching is concerned with organs and tissues that the family doctor may lose sight of the patient as an individual with fears, anxieties, guilt feelings, and inadequate relationships with other people. It is considered by general practitioners that about 30% of their patients have some form of psychiatric disturbance. These fall into five main groups which frequently overlap. They are anxiety and depression from emotional stress, constitutional liability to anxiety or depression, constitional personality and behavior difficulties, psychoses, and organic brain disease. The last two are comparatively rare, but involutional depression and arteriosclerotic senile dementia are by no means uncommon.

Every organic illness has its natural psychological component, which may be hardly noticed or severe. Such conditions as cancer, venereal disease, arthritis, and heart disease may be accompanied by superadded emotional upset, while others—premenstrual tension, spastic colon, ulcerative colitis, asthma, and eczema—are on the borderline between the physical and psychological. Certain symptoms are particularly prone to cause reactive anxiety or depression. Many of these patients with psychological disturbances have to be supported and managed by their family physician. The general practitioner starts with an advantage over the consultant in the management of these patients because of his knowledge of their background and their families. Responsibility for mental health will rest more and more on the general practitioner in the future. A great deal remains to be done before he is skilled enough and adequately equipped to do as good work in this field as he is able.

Psychological medicine should be taught more thoroughly to all medical students, and more opportunities for postgraduate training in it should be open to all general practitioners. It might be advantageous for a group of physicians to have one partner who, though still in general practice, has been specially trained in this branch of medicine. In helping their patients with psychological illnesses family doctors should take more opportunity to develop team-work in the ancillary health services to which they have access. The Ministry of Health should investigate the possibility of giving more opportunities and recognition to general practitioners with a special interest in psychological medicine.

Ischemic Heart Disease.—Thomas and co-workers estimated the prevalence of ischemic heart disease in South Wales (*Lancet* 2:540, 1958). The cardiovascular status of 100 miners from an industrial area was compared with that of 100 men from an agricultural area nearby. The age range was 55 to 64. A pilot survey in which clinical, radiologic, and electrocardiographic evidence was used for diagnosis suggested strongly that the electrocardiogram was the most useful in assessing cardiac status. The clinical examination was sometimes of value, but the posteroanterior chest x-ray was of little diagnostic aid. The same clinician made a diagnosis on the clinical and electrocardiographic evidence, and all electrocardiograms were interpreted by three cardiologists, whose findings varied widely. Two indexes of ischemic heart disease were used—the clinical index, based on clinical assessment, electrocardiography and radiography by one cardiologist, and the electrocardiographic index, based on agreement between three cardiologists that an electrocardiogram showed changes compatible with the diagnosis of ischemic heart disease. The prevalence in these men, based on clinical assessment, was 25% in the agricultural area and 38.3% in the mining area. The figures based on electrocardiographic assessment were 17% and 21.3% respectively. Though the mining group seemed to have a somewhat higher prevalence of ischemic heart disease, the difference was not statistically significant. Those affected were both taller and heavier than the others. The siblings of the men with ischemic heart disease had a higher mortality than the siblings of the controls. No significant difference was noted in the mean serum cholesterol levels in those with and those without ischemic heart disease.

New Hypoglycemic Agent.—The results obtained in 43 diabetics treated with a new hypoglycemic agent, chlorpropamide, were reported by Murray and co-workers (*Lancet* 2:553, 1958). Chlorpropamide, or N(propyl-N-chlorobenzene) sulfonyl urea, which is chemically related to carbutamide and tolbutamide, was given to a group of diabetics who had had diabetes for less than 10 years, who were either not taking insulin or had not been taking it for more than two years and who were over 40 years old. Diet alone failed to control the diabetes in most of these patients. Thirteen were hospitalized, and 30 were outpatients. The drug was given as a single daily dose of 1 Gm. orally. If after a few days treatment a good response was obtained, the dose was reduced to the lowest effective level. A satisfactory hypoglycemic response was obtained in 28 of the 43 patients treated, or in 65%. Ketonuria had been previously noted in 27% of the failures, compared with 4% of the successes. If a favorable response occurred, judged by a sugar-free urine, it did so by the second or third day, and always within a week. In the responders the mean blood sugar level fell from 273.5 mg. per 100 ml. before treatment to 161.8 mg. at the end of two weeks, while in the nonresponders the mean figures were 364.5 mg. and 304.5 mg. The mean daily glucose output was reduced from 35.5 to 3.4 Gm. in the responders, and in the nonresponders it remained constant at 58 to 60 Gm. daily.

Over half the responders had been previously treated with carbutamide or tolbutamide. The impression gained was that chlorpropamide was less potent than carbutamide but more potent than tolbutamide. Increasing the dosage to 3 Gm. daily brought under control three patients who did not respond well to 1 Gm. daily initially. As it was not thought desirable to give more than 1 Gm. daily, this dosage was considered excessive and the cases were regarded as failures. There were no serious toxic effects, such as leukopenia or thrombocytopenia. Nine patients complained of nausea, a diffuse erythematous rash, and drowsiness. Increasing the daily dose from 1 to 2 Gm. often caused these side-effects.

Cost of Iron Preparations.—The cost of iron preparations for oral use in general family and hospital practice was investigated by Davidson and Richmond (*Lancet* 2:570, 1958). They stated that ferrous sulfate tablets, with or without added trace elements, and whether bought as a proprietary or nonproprietary preparation, were the cheapest form of iron for oral medication. Since ferrous sulfate raises the hemoglobin level as effectively as other iron salts, such as the gluconate and succinate, and, when given in comparable doses of elemental iron, is no more likely to cause gastric upsets, it should be the first choice for oral iron therapy. An analysis of hospital prescriptions showed that ferrous sulfate forms 46% of all the iron preparations prescribed, while the newer organic iron preparations form 54%. In general practice, however, ferrous sulfate tablets form only 23% of all the iron preparations prescribed, whereas the more expensive organic preparations form 77%. The cost of iron tablets to the National Health Service is about $150,000 per month, but if ferrous sulfate were always prescribed whenever iron for oral use is required, the annual saving would be nearly $1,000,000.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Effect of Acute Digitalization in Patients with Rheumatic Heart Disease. L. Werkö, H. Eliasch, B. Thomasson and E. Varnauskas. Cardiologia 33: 161-194 (No. 3) 1958 (In English) [Basel, Switzerland].

The immediate effect of the administration of cardiac glycosides was studied in 56 patients with rheumatic heart disease. Four of these patients had aortic valvular disease only, 31 had pure mitral stenosis, 1 had mitral incompetence, 8 had multivalvular involvement, and the remaining 12 had mitral stenosis associated with other disease. Ten patients were in congestive failure. In 20 patients the clinical diagnosis was confirmed by autopsy. Lanatoside C was given to 37 patients in a dose varying between 0.4 and 1.6 mg., strophanthin K was given to 11 patients in a dose of 0.5 mg., Scillaren was given to 6 patients in a dose varying between 0.5 and 1 mg., and acetyldigitoxin was given to 3 patients in a dose of 0.6 mg. The cardiac output and the pressures in the pulmonary and systemic circulations were determined before the drug was administered and 30 and 60 minutes after the drug was given. In 6 patients the response to 10 minutes of exercise was studied 30 to 40 minutes after the drug was given. In 2 patients similar exercise studies were performed both before and 30 minutes after lanatoside C had been administered. In 7 patients the effect of the cardiac glycoside was studied after the extracellular fluid volume or plasma had been increased by rapid intravenous infusions of crystalloid or colloid solutions. In 2 patients pulmonary edema occurred early in the procedure. In these patients the effect of therapy with lanatoside C and strophanthin K, respectively, was studied before any other treatment was instituted.

It was found that in acute digitalization the right atrial pressure decreased in all patients. This decrease was of physiological significance only in the patients with right heart failure (from 10.8 ± 1.54 to 4.8 ± 0.95 mm. Hg). The pulmonary arterial blood pressure decreased in some patients, and its drop was most pronounced in the patients with atrial fibrillation who were not in congestive heart failure (39.8 ± 4.09 to 31.2 ± 3.34 mm. Hg). The cardiac output increased only in the patients in congestive heart failure. The stroke volume increased only in the patients with atrial fibrillation: in those not in congestive failure, from 39.8 ± 4.45 to 51.1 ± 5.09 mm. Hg; in those in congestive failure, from 36.7 ± 4.61 to 48.2 ± 5.73 mm. Hg. The heart rate usually decreased. This was most marked in patients with atrial fibrillation. Strophanthin K and Scillaren had the most rapid action, but the rapidity of action of lanatoside C and acetyldigitoxin almost equalled that of the first 2 drugs. Otherwise no difference was found among the drugs. The exercise tolerance was greatly improved in the patients with atrial fibrillation but not in those with sinus rhythm. Digitalization did not influence the hemodynamics to any great extent in the patients without congestive failure in whom the plasma volume was increased with infusions of crystalloid or colloid solutions. In 2 patients severe pulmonary edema occurred in the course of treatment. The edema did not disappear as a result of treatment with lanatoside C in one patient and with strophanthin in the other; administration of oxygen relieved the anoxia, and after additional administration of morphine and theophylline the edema disappeared.

Patients with mitral stenosis and sinus rhythm should be digitalized only if they have signs of congestive heart failure or if left ventricular failure is suspected (in the presence of arterial hypertension, mitral incompetence, or aortic valvular disease). Patients with mitral stenosis and atrial fibrillation should always be digitalized regardless of the occurrence of signs of failure of the right heart. Further studies regarding the behavior of patients with mitral stenosis during exercise in different stages of digitalization seem to be indicated.

Some Aetiological Aspects of Coronary Heart Disease: An Indian Point of View Based on a Study of 867 Cases Seen During 1948-55. R. P. Malhotra and N. S. Pathania. Brit. M. J. 2:528-531 (Aug. 30) 1958 [London].

The authors report on 754 men and 113 women with coronary heart disease who were admitted to hospital or seen in private practice in Amritsar in the Punjab, India, between 1948 and 1955. Obser-

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

vations on these patients concerning age (including the younger age groups), profession, family history, body build in general, and association with diabetes mellitus and hypertension did not in any way differ from those of Western workers. The ratio of men to women was more or less the same as that described by Western workers; thus, the degree of relative immunity from coronary disease enjoyed by the female sex in India is no greater than in the West despite the fact that women lead a comparatively much more sheltered and indoor type of life, that they are mostly vegetarians, and that addiction to tobacco or alcohol is practically unknown among them.

The role of the fat content of diet in the causation of coronary disease is a controversial point. The fat content of the diet taken by most of the 867 patients was poor as compared with European standards. Consequently it seems difficult to believe that dietary fat can play any significant part in the causation of coronary disease. The observations on these patients showed that vegetarians are no less prone to the occurrence of coronary disease, and the same is true of nonsmokers, since no less than 50% of the patients belonged to the Sikh sect whose religion forbids smoking. Obesity has long been recognized as an important predisposing factor. Of the 754 men, 204 were obese, 500 were of average type of build, and 50 were thin; of the 113 women, 48 were obese, 57 were of average type of build, and 8 were thin. These data suggest the greater importance of obesity in the causation of coronary disease in women than in men.

Coronary disease is a major cause of deaths in countries that are materially more advanced. Of the 867 patients, only 123 (14%) were from rural areas, but this finding does not justify the assumption that the disease is less prevalent among persons living in places remote from modern civilization. Patients from villages came to the town hospitals only when they were severely disabled by congestive heart failure or when their physical activity was seriously curtailed by severe anginal pain on effort. Brief or mild episodes of coronary disease remained unnoticed, and the same was true for sudden deaths. Furthermore, small villages near big towns cannot be considered rural in the real sense of the word. A great deal of work and money would be required for an investigation in those remote areas of India in which the mode of life continues to be what it was in the 18th century. With the present standard of vital statistics in India, it is difficult to give the true incidence of coronary disease in this part of the world. But with 867 cases of coronary disease (28.4%) occurring among a total of 3,054 patients with diseases of the heart seen during the observation period, it is difficult to share the view held by Western workers that coronary disease is uncommon in materially less-favored countries.

Traumatism in the Pathogenesis of Primary Rheumatism. L. Schiavetti and A. Gospodinoff. Policlinico (sez. prat.) 65:1015-1025 (June 30) 1958 (In Italian) [Rome].

The authors reviewed the history of 400 patients with rheumatic disease, who were treated at the Center of Rheumatology in Rome during the period 1952-1957, and found that 14 of them (3.5%) had a post-traumatic rheumatic arthritis. Traumatism is probably an aspecific, pathogenetic factor which contributes to the clinical manifestation of primary rheumatism (rheumatic fever, rheumatoid disease, and ankylosing spondylitis) in persons who are predisposed to the disease. This correlation was more clearly observed in instances of acute rather than in chronic rheumatic disease. A period varying between 13 and 25 days elapsed between the traumatic episode and the manifestation of the rheumatic disease.

The case of a woman, aged 36 years, is reported, which illustrates the pathogenetic correlation between traumatism and primary rheumatic disease. The patient had had post-traumatic hydrarthrosis in the right knee 4 years previously. The synovial fluid showed no evidence of inflammatory reaction, and the disorder subsided shortly. However, swelling associated with an intra-articular inflammatory exudate reappeared 3 months later, and after that at irregular intervals. The disease developed into intermittent hydrarthrosis. An injury to the left hand, which occurred 2 years later, was followed by rheumatic arthritis; this process involved the patient's ankles and knees the following year.

The correlation between traumatism and primary rheumatic disease is also relevant in problems of health insurance and industrial health. The physician sometimes has to evaluate the extent to which a mechanical injury has contributed to the development of a rheumatic disease, or he may be called upon to dissuade persons who are predisposed to rheumatic disease from engaging in activities exposing them to acute or chronic mechanical injuries.

Dicumarol and Serum Uric Acid. O. E. Hansen and C. Holten. Ugesk. læger 120:974-975 (July 24) 1958 (In Danish) [Copenhagen].

A uricosuric effect of Dicumarol has been observed. In most of the 40 patients given anticoagulant treatment with heparin prolongatum and Dicumarol, there was a reduction of over 20% in the serum uric acid value. The uric acid determinations were made as double measurements according to the Praetorius method. The question is raised as to what extent the improved prognosis in ischemic cardiac disorders after treatment with anticoagulants depends only on the prolonged coagulation time, or whether the effect of these agents on the uric acid metabolism may be significant.

The Salicylate Problem with Special Reference to Methyl Salicylate. H. M. Cann and H. L. Verhulst. J. Pediat. 53:271-276 (Sept.) 1958 [St. Louis].

The widespread use of acetylsalicylic acid, the extreme toxicity of methyl salicylate, and the public's unawareness of the toxicity of these substances are the main reasons for the extent of this problem. When a child has accidentally ingested a salicylate product, treatment should be started as soon as possible. In all cases the stomach must be emptied promptly, and mild intoxication can be remedied by this procedure alone. Since methyl salicylate delays stomach emptying, gastric lavage may, therefore, be carried out as long as 4 to 6 hours after ingestion. If gastric lavage is performed, sodium bicarbonate should not be used, since it enhances salicylate absorption from the gastrointestinal tract. In 2 of the 3 cases cited, in which children died from accidental ingestion of methyl salicylate (wintergreen oil), despite labeling on the bottle, the warning was not heeded that the drug should be "kept out of the reach of children." In none of the 3 cases were immediate attempts made to empty the stomach, and proper therapy was delayed. In one case the similarity of a methyl salicylate container and a cough medicine container was apparently the cause of the fatal accident. The practice of some physicians in advising hospitalization—if only for overnight observation—in most cases of salicylate ingestion, whether or not symptoms have occurred, emphasizes the necessity of prompt, vigorous therapy and close observation in all instances of salicylate overdosage. The latter is especially important in methyl salicylate poisoning where the usual asymptomatic period after ingestion makes prolonged observation mandatory.

In acute salicylate poisoning, water is lost from the body by diaphoresis, hyperpnea, vomiting, and diarrhea, which loss results in impaired renal function and decreased salicylate excretion. The hypoprothrombinemic effect of salicylates, which can be corrected by the administration of vitamin K preparations, is well known. The treatment of established salicylate intoxication consists of giving fluids intravenously (orally in mild cases) to correct the existing water deficit; dextrose is administered to combat ketosis, intravenously administered calcium gluconate is given in the event of tetany, and oxygen should be administered if convulsions occur. Base solutions are contraindicated in the early stages, as they may lead to tetany, convulsions, and death, and they should not be given until acidosis supervenes some 4 to 6 hours later. Although there are some individuals who feel that sodium bicarbonate is not harmful when given early in the course of the development of symptoms, and despite the fact that renal excretion of salicylates is enhanced in the presence of an alkaline urine, base therapy must be administered cautiously, as rapid correction of the acidosis may result in alkalosis. Barbiturates, paraldehyde, and morphine are definitely contraindicated because of their synergistic effect with the salicylates in producing central nervous system depression. Good clinical results have been obtained with hemodialysis, and exchange transfusion has been used in cases of methyl salicylate poisoning with favorable results.

The 1957 Influenza Epidemic: A Study of 500 Cases Admitted into the J. A. Group of Hospitals, Gwalior, M. P. P. N. Laha and D. R. Bapat. J. Indian M. A. 31:53-58 (July 16) 1958 (In English) [Calcutta].

The authors report on 477 adults and 23 children with influenza who were admitted to a group of hospitals in Gwalior, Madhya Province, India, between June 1 and July 31, 1957, when the influenza epidemic engulfed the Gwalior area which includes 3 towns, namely, Lashkar, Gwalior, and Morar. The cases of influenza were distributed among the 3 religious groups (Hindu, Moslem, and Christian) in proportion to the number of persons in each group. Most of those affected (74.2%) were between the ages of 16 and 30 years. Males predominated in a ratio of 7 to 1 among adults and of 5 to 1 among children. The epidemic affected persons of every variety of occupation. Roughly estimated, the attack rate at Gwalior was 20% of the population. Fever, headache, cough, and body ache constituted the major tetrad of symptoms. Weakness and lassitude were present in only 4.2% and giddiness in only 2.1% of the patients. There was a small proportion of patients with only local symptoms, such as coryza and sore throat. Vomiting and rigor were sometimes very prominent in children, and atypical symptoms, such as dyspnea, giddiness, and increased frequency of micturition, were also observed. Laboratory studies were done on 100 patients; 91 of these had a normal white blood cell count, 5 had leukocytosis, and 4 had leukopenia. The erythrocyte sedimentation rate was increased in 84 patients and was normal in 16. The course of the disease lasted from 3 to 5 days in most of the patients, but in some patients it was prolonged to 7 days. There were no significant complications. The relapse rate was about 5%. There were no deaths.

All the patients were treated in separate wards to prevent spread of the infection to other patients in the hospital. The patients were kept under complete rest for at least 4 days even after the temperature was restored to normal, since premature activity was an important cause of relapse. Of the 500 patients, 237 were given salicylates, and 193 received salicylates and intramuscular injections of crystalline penicillin; 30 patients were treated with salicylates, crystalline and procaine penicillin, and dihydrostreptomycin, 20 with sulfonamides, and 20 with crystalline penicillin alone. The number of days required to cure the patients ranged from 3 to 7 in each of the 5 groups. It was concluded that drugs did not modify the course of the disease.

Blood Ammonia Determinations in Liver Diseases. Li P'ei-Kuang, Lu Han-Ming, Ho Chih-Hsiung and others. Chinese M. J. 76:529-542 (June) 1958 (In English) [Peking, China].

The relationship of the liver and of the portal circulation to the metabolism of ammonia was recognized more than 60 years ago when the syndrome called "meat intoxication" was observed in Eck-fistula dogs with high blood ammonia levels. Later evidence was found that the elevation of blood ammonia levels might be one of the important causes underlying hepatic coma. The occurrence of episodic stupor in patients who have undergone portacaval anastomosis is likewise associated with elevated blood ammonia levels. The authors made 226 determinations of the ammonia content of the peripheral blood in 97 patients with a variety of liver diseases and several miscellaneous conditions, with or without involvement of the liver. The blood ammonia was determined by Conway's microdiffusion technique, as modified by Ting and Liu. Results were expressed in micrograms of ammonia-nitrogen per 100 ml. of blood. In normal controls the figures ranged between 20 and 50 mcg. per 100 ml., and 50 mcg. per 100 ml. was therefore accepted as the upper normal limit.

The authors have tabulated the ammonia-nitrogen values obtained in patients with cirrhosis of the liver, hepatitis mostly of viral origin, primary carcinoma of the liver, amebic abscess of the liver, schistosomiasis, nephritis, gastrointestinal diseases, cardiac disorders, and miscellaneous diseases. The results suggest that the ammonia-nitrogen values may, to a certain extent, reflect the functional state of the liver. An elevation of the ammonia level is usually observed in cases of liver diseases with diffuse parenchymatous damage and portal-systemic shunt or collateral circulations. In hepatic coma or precoma the ammonia-nitrogen values are usually very much elevated, greatly exceeding the values observed in the same patient during the absence of coma. It is, therefore, believed that the disturbance of ammonia metabolism must be one of the important causes of hepatic coma.

The ammonium chloride tolerance test was made in a group of patients with and in a group without hepatic insufficiency and collateral circulation. The results of this test differed greatly in these 2 groups, and it is suggested that this test may supplement the simple blood ammonia-nitrogen determinations.

Primary Renal Hypokalemia–Primary Aldosteronism. G. Alsted and P. Halberg. Ugesk. læger 120:979-982 (July 24) 1958 (In Danish) [Copenhagen].

The differential diagnosis between primary renal hypokalemia and primary aldosteronism is difficult but extremely important. In hypokalemia continued potassium treatment must be applied, while aldosteronism can be cured radically by operation. A case of potassium-losing nephritis in a woman, aged 43 years, is described. There had been no previous renal disorder. The chief symptoms were loss of weight, progressive muscular adynamia, slight proteinuria, polydipsia, polyuria, and hyposthenuria. There were hypokalemia and typical changes in the electrocardiogram. Potassium therapy was instituted, but the patient died within 2 weeks after admission. At autopsy nephrotic changes were found in the kidneys, but there was no evidence of acute or chronic renal infection. The adrenal glands were morphologically normal; the pituitary gland was somewhat enlarged; and microscopic examination revealed an increased number of basophil cells in small adenoma-like groups. Technical facilities for determining the aldosterone excretion were not available. Because of the findings in the hypophysis and the absence of primary infectious renal changes, and in spite of the absence of a tumor in the adrenal cortex, the case is regarded as one of primary aldosteronism.

UROLOGY

Retrograde Ejaculation as Cause of Sterility in the Male. A. M. C. M. Schellen. Nederl. tijdschr. geneesk. 102:1252-1253 (June 28) 1958 (In Dutch) [Amsterdam].

The author presents the history of a 35-year-old man who had been married for 8 years but who had no children. The history revealed that during coitus the patient had the sensation that, while semen was expelled, there was no ejaculum. Since the patient's genitalia seemed to be free from pathological changes, he was told to urinate shortly before and shortly after cohabitation and to collect the postcoital specimen for examination. Two postcoital specimens of urine revealed the presence of normal spermatozoa. The author feels that the patient has an idiopathic form of retrograde ejaculation. If a patient with this condition requests treatment for sterility, urologic therapy may be contemplated but is often found impracticable. Artificial insemination may be effected with seminal fluid obtained from the patient's bladder. The author found reports of 8 similar cases in the literature and believes that more cases will be recognized if retrograde ejaculation is thought of in patients with aspermia.

Vesicoureteral Reflux in Children. B. W. Jones and J. W. Headstream. J. Urol. 80:114-115 (Aug.) 1958 [Baltimore].

The authors report on 70 boys and 30 girls, their ages ranging from 14 days to 14 years, who were subjected to voiding cystography in order to determine whether reflux occurred in children without history or findings suggestive of urinary tract disease. These patients had a nonurologic admission with a negative urinalysis. Of the 100 children examined by voiding cystography, only 1 exhibited vesicoureteral reflux. Subsequent examination of the patient with vesicoureteral reflux revealed bladder neck contracture, and a transurethral resection was performed with an uneventful postoperative course. Follow-up studies 6 months later demonstrated bilateral reflux on voiding cystography, no residual urine, and negative urinalysis. It is the authors' belief that children with normal urinary tracts will not exhibit vesicoureteral reflux. Thus, this study supports the findings of those who claim that vesicoureteral reflux occurs only in the presence of demonstrable uropathy.

OTOLARYNGOLOGY

Executive's Dysphonia: A Study of 49 Patients. W. H. Gardner. Cleveland Clin. Quart. 25:177-186 (July) 1958 [Cleveland].

The subjects of this study were 49 business men who had been referred for examination of the voice. The majority were from sales and personnel departments. They were selected on the basis of 2 criteria: (1) the patient held an executive position that involved command of and communication with a large number of persons, and (2) his vocal disorder could be classed as functional dysphonia. The patients ranged in age from 32 to 70 years. Forty-four of the 54 findings among the otolaryngologists were in patients with functional dysphonia, 6 in those with contact ulcers, and 4 in those with nodules. Chronic rhinitis was the single most frequent finding. The duration of the vocal disorders ranged from 1 month to 20 years. The 49 patients reported 243 symptoms: 153 by those having functional dysphonia, 63 by those having contact ulcers, and 27 by those having nodules. Hoarseness was reported by all the patients. A total of 194 vocal deviations, including hoarseness, monotony, and breathy voice, were observed by the voice therapist, an average of 4 deviations per patient. More than half of the 49 patients had limited ranges of speaking pitch.

In addition to voice therapy that was recommended for all 49 patients, antihistaminics or hypoallergics (16), diet and vitamins (16), no smoking (6), prednisone (3), and tranquilizers (2) were advised for 43 of the executives having dysphonia. Voice therapy was successful in all of the 37 patients who participated in the program; 31 achieved clear voices, and 6 had improved voices. In 9 of the 10 patients having contact ulcers who received voice therapy, the ulcers disappeared or improved; and in 5 of the patients having nodules, the nodules cleared or improved. The remaining 3 patients having contact ulcers who refused therapy remained unimproved; 1 of these developed an additional granulation requiring surgery. Of the 9 patients having functional dysphonia who did not receive voice therapy, 5 refused the therapy and appeared to be satisfied with the results of tranquilizers; 3 refused the therapy because they were "too busy"; and 1 was referred to another therapist. The author is of the opinion that the best results are obtained with a combination of voice therapy and medical measures.

Intermittent Parotid Swelling Due to Ill-Fitting Dentures—An Entity; Its Diagnosis and Treatment. A. C. Furstenberg and I. M. Blatt. Laryngoscope 68:1165-1181 (July) 1958 [St. Louis].

The authors report on 3 women, between the ages of 46 and 72 years, with diffuse parotid swelling associated with pain and a feeling of pressure in the cheek while eating. All 3 patients had been wearing complete or partial dentures for many years. When salivary flow was stimulated by lemon, the parotid gland swelled. On massage of the parotid region, only a sluggish flow of clear saliva from a hypertrophic parotid papilla was noted. The cordlike dilated Stensen's duct was palpable along its buccomasseteric course. On probing the duct, dilated segments alternated with strictures. The wall of the duct imparted a gritty sensation on probing; this was caused by the hypertrophic and metaplastic duct epithelium.

This condition of parotid swelling appears definitely to be associated with the presence of dentures. The patient is required to alter the mechanism of mastication in a manner which does not sustain the normal chewing habit. As food is being chewed on one side of the mouth, the parotid papilla on the opposite side tends to be sucked mesially and bitten. Mastication is further rearranged and altered when alveolar absorption occurs, allowing the dentures to shift about while chewing. When the parotid papilla is subjected to repeated trauma and inflammation, fibrous tissue proliferation and scar tissue cicatrization occur. This interferes with normal salivary flow, and the ensuing pressure behind the stricture results in dilatation of the duct of the gland. Secondary bacterial infection supervenes with a diffuse inflammatory reaction along the buccomasseteric course of Stensen's duct and with production of multiple inflammatory strictures. If a stricture in the secondary or tertiary ducts seals off a section of secreting acinar tissue, an inflammatory cyst may be formed. Secretory sialography is useful in making the diagnosis and in differentiating the condition from nonobstructive sialectasis.

Surgical treatment in this series consisted of subtotal parotidectomy on one patient, in whom an inflammatory cyst was revealed by the parotid sialogram. Dochoplasty was carried out on the other 2 patients. Healing was prompt. Rapid regression of parotid swelling occurred in all 3 patients, and they remained asymptomatic. Microscopic examination of the surgical specimen revealed stenosis, scar tissue formation, and metaplasia of the duct epithelium. All these findings were compatible with traumatization of the parotid papilla. The syndrome of obstructive sialodochitis, with intermittent parotid swelling caused by ill-fitting dentures, may be regarded as a definite entity.

THERAPEUTICS

Advantages and Limitations of Additional Treatment of *Tuberculous Meningitis* with Corticosteroids. B. Dieckmann. Beitr. Klin. Tuberk. 118: 252-261 (No. 4) 1958 (In German) [Berlin].

The author reports on 8 women and 6 men with tuberculous meningitis, who were treated continuously with streptomycin and isoniazid until their cerebrospinal fluid was restored to normal; 1 Gm. of dihydrostreptomycin was given first daily and later twice weekly by intramuscular route, and 10 to 20 mg. of isoniazid was given orally. Seven of the 14 patients received, in addition, cortisone, hydrocortisone, or prednisolone orally, and 2 patients with spinal block received these drugs also by lumbar and cisternal route. The survival rate in both groups of patients was the same; a 50-year-old man in the cortisone group died after temporary improvement at the end of the 11th week of treatment, and a 54-year-old woman in the other group died in the 4th week. The surviving patients in the cortisone group were followed for 1 to 1½ years and those in the other group for 2 to 4 years after their discharge from the hospital. All 12 surviving patients remained free of recurrences, but one of those who had not received cortisone therapy still had spastic paresis of both legs and another had paralysis of the right peroneus muscle. Two women in the cortisone group also had residual neurological symptoms. The body temperature of the patients in the cortisone group was restored to normal in one-third the time required by those in the other group. Drop of temperature by crisis did not occur in any of the patients; defervescence occurred within 2 to 6 weeks.

The cerebrospinal fluid of the patients in the cortisone group was restored to normal (with cell values not exceeding 30 per cubic millimeter, glucose content at least 50% of the actual blood sugar level, and protein level below 25 mg. per 100 cc.) in two-thirds the time required by those in the other group, i. e., 15 weeks, on the average, in the cortisone group as compared with 22 weeks in the other group. Exacerbations no longer occurred after that time. The more rapid normalization of the spinal fluid was reflected not only by the reduced number of cells but also by the glucose level. The protein level dropped rapidly except in one patient with spinal block; in the latter, however, block systems were no longer demonstrable at the end of 21 weeks of therapy after he had received 15 to 30 mg. of prednisolone orally daily and 12.5 mg. of hydrocortisone every second or third day by the cisternal route for 10 weeks. Improvement of the general condition was impressive in the cortisone group; within a few days of therapy there was a fundamental change, with clearing of consciousness, euphoria, increased appetite, and increase in body weight. There were no significant untoward reactions. Slight hypopotassemia was compensated by oral administration of potassium chloride. The shortened duration of treatment also had the advantage that less streptomycin and isoniazid had to be given.

Rapid improvement of the general condition, rapid defervescence, and marked shortening of the duration of treatment are the advantages of the combined antituberculous and cortisone therapy. The expectations concerning the removal of the obstruction in the spinal canal and that of neurological complications were not fully justified.

Treatment of Biermer's Disease with a Combined Preparation of Intrinsic Factor and Vitamin B_{12}: Clinical Trials. P. Croizat, L. Revol, R. Creyssel and others. Presse méd. 66:1204-1206 (July 2) 1958 (In French) [Paris].

A French proprietary preparation, containing 125 mg. of intrinsic factor, 100 mcg. of cyanocobalamin (vitamin B_{12}), 100 mg. of ferrous betaine, and 75 mg. of concentrated liver extract, was given a therapeutic trial in 35 patients with pernicious anemia who received this preparation orally. Eleven of the 35 patients were given large doses of 3 to 6 tablets of the preparation daily. In 9 of the 11 patients a reticulocyte crisis was produced in a normal manner, at the 3rd day as the earliest and at the 8th day as the latest; it was possible to follow in a regular manner the normalization of the Price-Jones curve in the course of the treatment. The drop in the iron level of the serum was also observed in a regular manner; complementary treatment with iron was even required occasionally. A normal vitaminemia was obtained in 6 of the 11 patients. These results compared favorably with those obtained in 64 patients with pernicious anemia, who were treated in the classic manner by the parenteral route, 42 of them receiving injections of cyanocobalamin, 8 receiving folic acid, and 14 receiving liver extracts. The oral treatment was ineffective in only 2 patients; in one of them a reticulocyte crisis could not be obtained either by injections of cyanocobalamin, and in the other such a crisis was obtained by additional treatment with folic acid.

The observations on the 11 patients treated orally suggested the use of the combined preparation of intrinsic factor and cyanocobalamin as a routine oral treatment for pernicious anemia. Twenty-four patients with pernicious anemia, who for 3 years did not have any recurrence of anemic or neurological type while receiving maintenance treatment with cyanocobalamin by the parenteral route, were given substitute treatment with the combined preparation of intrinsic factor and cyanocobalamin by mouth. There was no change notable in the red blood cell count of these patients. The average number of red blood cells (4,670.000 per cubic millimeter) observed in the patients receiving oral treatment was nearly identical with the number (4,550,000) observed in 28 patients treated by the parenteral route and reported on by other workers. The cyanocobalamin blood level of the patients given oral treatment with the combined preparation remained definitely reduced (an average of 0.175 mg. per cubic centimeter). There was no difference between this level and that obtained with other preparations. The new preparation, as a rule, was well accepted by the patients.

Severe Neurological Manifestations in Four Children Receiving Compazine (Prochlorperazine). J. T. Jabbour, J. A. Sheffield and J. M. Montalvo. J. Pediat. 53:153-159 (Aug.) 1958 [St. Louis].

Prochlorperazine (Compazine) is a relatively new antiemetic and tranquilizing agent, belonging to the large group of phenothiazine derivatives, of which chlorpromazine (Thorazine) and promazine (Sparine) are also members. The chemical name is 2-chloro-10-[3-(1-methyl-4-piperazinyl) propyl] phenothiazine. It was introduced into practice as an antiemetic and tranquilizing agent considered to have somewhat fewer toxic and side-effects than certain other ataractic agents. The authors present 4 children, ranging in age from 14 months to 5½ years, in whom Compazine produced a dramatic and characteristic clinical picture, with the following striking features: marked drowsiness and lethargy; oculogyric crisis; retraction of the neck, at times with torticollis; trismus; opisthotonos; at times, flexor rigidity; and hyperreflexia. These manifestations appeared suddenly in attacks that lasted from a few seconds to 2 hours and were followed by lucid intervals with normal neurological examination; there was a marked tendency to repeated attacks over a period of several hours. No permanent neurological damage was detected in any of the 4 children who were followed for a period of one month after their reactions. Two children received the drug on prescription for its antiemetic effect. The drug was given to another child for its tranquilizing effect in order to facilitate the intravenous administration of fluids. The 4th child accidentally ingested the drug. The amount given was clearly excessive in 2 cases and unknown in 1. However, the severest reaction of all occurred in the child who received the usually recommended dosage.

The Use of Trypsin in the Therapy of Tuberculous Lymphadenitis and Tuberculous Fistulae. C. Rapoport. Dis. Chest 34:154-161 (Aug.) 1958 [Chicago].

The author reports clinical observations made between 1951 and 1957 on 6 girls and 2 boys, ranging in age from 8 to 13 years, and on a 33-year-old man, all of whom had been admitted to the Malben Tuberculosis Hospital in Israel. Seven of the children had tuberculous lymphadenitis, a 10-year-old girl had tuberculosis in portions of the sternum, and the man had tuberculous fistulas under the right clavicle with involvement of the first rib on the right side. Only those patients were selected for trypsin therapy in whom unequivocal evidence of the tuberculous causation of the lesions was present and who did not improve despite prolonged treatment with other antituberculosis drugs. Bacteriological studies (for Koch's bacillus), routine blood studies, urine examinations, liver function tests, electrocardiograms, and biopsies were performed at the start, during, and at the end of treatment, and for each patient roentgenograms were obtained of the neck, chest, vertebral column, and appropriate bones.

The patients received pure crystalline trypsin in sesame oil, 5 mg. daily in 2 divided doses for 6 weeks. The drug was administered intramuscularly in combination with one or more of the following: streptomycin, tetracycline, isoniazid (Rimifon), and aminosalicylic acid (PAS). In some patients the treatment was continued daily for 6 months, with an additional course of trypsin being given for 3 weeks at the termination of the 6-month period. No side-effects were noted during the treatment. Several patients obtained clinical healing within 3 to 6 weeks, as evidenced by a marked decrease in the size of the lymph nodes, disappearance of these nodes, closure of the fistulas, and scar formation. In those with bone tuberculosis the lesions healed more rapidly. From a histopathological point of view all the biopsies performed showed either marked improvement of the microscopic picture or evidence of complete healing. The rich deposition of collagen in healed lesions was noteworthy. Biopsy specimens obtained from lymph nodes at the end of treatment were negative on smear, culture, and guinea-pig inoculation for Koch's bacillus. Trypsin administered together with antibiotics or antibacterial agents appears to be the treatment of choice for tuberculous lymphadenitis, and tuberculous fistulae secondary to the lymphadenitis, and for bone tuberculosis.

Haemorrhagic Thrombocythaemia: Report of Two Cases Treated with Radioactive Phosphorus. J. R. Fountain. Brit. M. J. 2:126-130 (July 19) 1958 [London].

Although bleeding accompanying thrombocytopenia is commonly seen in hospital practice, the association of hemorrhage and thrombocythemia is extremely rare, only 30 cases having been reported in the literature. Bleeding most commonly occurs from the nose and the alimentary tract; bruising is not uncommon; purpura is rarely observed; blood loss invariably results in a hypochromic anemia; and all cases show a raised platelet count and leukocytosis. Thrombotic episodes are not uncommon and are presumed to be a function of the increased number of platelets, although the exact mechanism is unknown. The bleeding time is sometimes prolonged, the remaining tests for hemostatic function being normal. Hemorrhagic thrombocythemia is usually associated with other myeloproliferative disorders or splenic atrophy. It may follow splenectomy, as was the case in one patient described in this article, and it is rarely primary in that it is unassociated with other pathological processes, as was found in the other patient reported by the authors. In both patients the platelet count returned to normal and the bleeding ceased after administration of radioactive phosphorus ($P.^{32}$).

A New Orally Effective Long-Acting Ganglion-Blocking Agent for Hypertension (189c56). S. Locket. Brit. M. J. 2:74-78 (July 12) 1958 [London].

The compound 189c56 is a preparation that was developed as the result of earlier pharmocological investigations of ganglion-blocking agents for use in hypertensive states. Compared with pentacynium methylsulfate, to which it is chemically related, about twice the dose of the active cation of 189c56 is required by subcutaneous or intravenous injection to produce a commensurate fall in blood pressure. The initial studies indicated that 189c56 produces hydrodynamic changes and effects on renal function comparable to those of pentacynium, and it was possible to identify 189c56 in urine many days after the last therapeutic dose. Within the dose range of 200 to 1,250 mg. administered daily by mouth, it was possible to produce prolonged and marked hypotension in every patient receiving the salt 189c56 bis-methylsulfate trihydrate. The initial dose was on the order of 200 mg., and this was increased by 50 mg. every day until an appreciable hypotensive effect was obtained. Once a satisfactory drug level was reached—and this level was quite critical—the degree and duration of hypotension achieved showed very little variation. Where the maintenance dose was in the range of 300 to 1,250 mg., a reduction of 25 to 50 mg. reduced the clinical effect considerably, and, conversely, an increase of the same magnitude converted a moderately severe hypotensive effect into a marked and prolonged hypotension.

Dryness of the mouth was noticeable with larger doses, although gastric emptying was unimpaired. Disturbance of vision occurred, as with other ganglion-blocking agents, and was usually insignificant and readily alleviated with physostigmine or pilocarpine. The severity of hypertension did not influence the drug schedule, although it was noticed that younger patients required heavier maintenance doses, as did patients exhibiting renal insufficiency. Disturbances of bowel motility, constipation, urine retention, and ileus were conspicuously absent. One patient, who when first seen had considerable renal impairment, showed a marked improvement in his hypertensive state and renal function. Another patient died of uremia, although his blood pressure had been adequately controlled. Of the 2 other patients with impaired renal function, one has shown a progressive deterioration in renal function in spite of an initial marked improvement in general condition, while the condition of the other has improved, the blood urea level falling steadily to less than 30 mg. per 100 cc. With an effective reduction in blood pressure, these patients have shown a reversal of retinal changes, alterations in the electrocardiogram to a more normal tracing, reduction in heart size, and amelioration of many disturbing symptoms, such as paroxysmal nocturnal dyspnea and angina on effort. No significant effect was elicited upon duration of action of the orally administered drug, size of the dose, time of onset of symptoms, or hypotension by the considerable variation in constitution of the diet. No significant potentiating action of chlorothiazide was demonstrable.

Hematologic Complications Arising During Ristocetin Therapy: Relation Between Dose and Toxicity. E. J. Gangarosa, N. S. Landerman, P. J. Rosch and E. G. Herndon Jr. New England J. Med. 259:156-161 (July 24) 1958 [Boston].

Ristocetin is a new antimicrobial agent, a lyophilized preparation representing 2 antibiotics, ristocetin A and ristocetin B. These components have been isolated from the fermentation broth of the Actinomycete species, Nocardia lurida. Advantages ascribed to ristocetin include low toxicity, lack of development of resistant organisms, and absence of cross resistance to other antibiotics. The authors review the clinical experience with ristocetin at the Walter Reed Army Hospital, Washington, D. C., and the U. S. Naval Hospital, Bethesda, Md. Of a total of 14 patients, 3 were treated terminally and died within 36 hours; another was given the medication for only 1 day and was subsequently treated with a different antibiotic. In 8 of the remaining 10 patients, complications developed during the course of ristocetin therapy. The other 2 patients were adult males who had staphylococcic pneumonia that responded dramatically to ristocetin, with complete resolution and without laboratory or clinical evidence of complications. In addition to routine hematological studies, the platelet count was followed carefully in 1 of these patients before, during, and after therapy, and no platelet depression was noted. The dose in these 2 cases did not exceed 25 mg. per kilogram of body weight per day.

Ristocetin in each of the 8 patients in this report was administered intravenously, dextrose being used as a diluent. Hematological complications developed in all 8 patients, and 3 of these had acute thrombocytopenia. Severe bleeding, which accompanied thrombocytopenia, contributed to the deaths of 2 patients. In the third patient with thrombocytopenia there was a prompt return of the platelet count to normal after the ristocetin dose was reduced from 50 to 33 mg. per kilogram of body weight. Blood examinations, including platelet counts, should be made regularly in patients receiving ristocetin. Furthermore, the drug should be used only in hospitalized patients to facilitate early recognition of complications and prompt treatment. Ristocetin therapy should be undertaken cautiously in patients with impaired renal function. The complications observed in this study are best explained by a peripheral direct toxic effect of ristocetin. Such complications may be reversible when recognized promptly and the drug withdrawn or the dose reduced. The authors feel that the demonstrated effectiveness of ristocetin in difficult enterococcic and staphylococcic infections, found to be resistant to other antibiotics, justifies its continued use.

Palliative Treatment of Cancer of the Genital Organs with Testosterone Enanthate. C. Giornelli. Minerva med. 49:2351-2354 (June 13) 1958 (In Italian) [Turin, Italy].

Twenty women with cancer of the genital organs were treated with testosterone enanthate after receiving a course of radium therapy and roentgenotherapy. Ten patients had cancer of the portio vaginalis uteri, League of Nations classification 3. The initial total dosage of testosterone enanthate, varying from 500 to 750 mg., was divided into 2 or 3 equal doses and administered every other day. The total maintenance dosage of 2,000 mg. was divided into 20 equal daily doses. This therapy produced improvement in the general state of the patients' health and in their appetite. Decrease in pain was not prompt, but it was lasting. The neoplastic masses had increased in size at the end of the treatment in all the patients.

Five patients had cancer of the portio vaginalis uteri, League of Nations classification 4. The initial total dosage of 1,000 mg. of testosterone enanthate was divided into 4 equal doses, which were administered every other day. The total maintenance dosage of 3,000 mg. was divided into 30 equal daily doses, with a drug-free period of 15 days after 20 days of therapy with the maintenance doses. This therapy produced slight improvement in the general state of health and in body weight and a decrease in pain. Gynecologic examination made 2½ months after discontinuance of drug therapy revealed larger neoplastic masses than at the onset of therapy in 2 patients; these 2 patients died afterward.

Three women had an inoperable cancer of the corpus uteri. The total dosage of testosterone enanthate, consisting of 2,500 mg., was administered in 2 courses lasting 15 and 10 days respectively. Testosterone enanthate brought about improvement in the general state of health and a decrease in pain. Consequently, the dosage of analgesic drugs which had been given to the patients was gradually decreased until it was nil. Two examinations, made 2 and 4 months after discontinuance of drug therapy, confirmed the persistence of the patients' improved state of health, appetite, body weight, and psychic state. Gynecologic examination revealed an unchanged state of the neoplastic masses.

Of the remaining 2 patients, one had a cancer of the vulva, with diffusion into the vagina and rectum and with bilateral inguinal metastases. She had received a course of roentgenotherapy. The initial total dosage of 1,000 mg. of testosterone enanthate was administered in 4 equal daily doses. The total maintenance dosage of 3,100 mg. was divided into 31 equal daily doses. The patient's state of health remained unchanged during the drug treatment, except for a slight improvement in appetite and in the psychic state. She died 5 months after discontinuance of drug therapy. The last patient, who was 47 years of age, underwent a Wertheim type of operation for carcinoma of the portio vaginalis uteri, classification 3, 8 months before the onset of chemotherapy. She was well for 6 months, after which intense pain in the lumbar region reappeared. The patient was given irradiation therapy, followed by treatment with testosterone enanthate in a total dosage of 2,300 mg. Improvement was evident 15 days after the beginning of this therapy, but deterioration began 3½ months later.

Clinical Evaluation of 6-Chloropurine in Leukemia of Adults. R. R. Ellison, D. A. Karnofsky and J. H. Burchenal. Blood 13:705-724 (Aug.) 1958 [New York].

Thirty patients, between the ages of 15 and 72 years, with acute leukemia were treated with 6-chloropurine. The bone marrow was predominantly or completely blastic in 14 of them. Five patients had acute granulocytic leukemia, and 11 had either acute granulocytic, myelomonocytic, or monocytic leukemia. Unless gastrointestinal side-effects necessitated diminishing the dose, 1 Gm. of 6-chloropurine was given daily as long as the total leukocyte count was stable or was falling slowly. If a rapid decrease occurred, the administration of the drug was discontinued temporarily and was started again as the count stabilized. Treatment was usually stopped temporarily when marrow cellularity was less than normal, as judged by the appearance of the smear and the aspirate, during the course of administration of the drug. Transfusions, intravenously administered fluids, and antibiotics were given when indicated by the clinical status of the patients. Three of the 30 patients had complete remissions, and 8 had partial remissions. The average time necessary for appearance of marrow remission was 8.1 weeks. In all 11 patients who had complete or partial remissions, a period of marrow hypocellularity preceded the occurrence of remission. The total period of response lasted from 4 to 46 weeks (average 18.3 weeks). In 6 patients who showed remissions, treatment was continued throughout the period of remission, and, therefore, relapse occurred during the treatment. Increasing the dose at the time of relapse in 2 patients produced no further response. In 4 other patients, 6-chloropurine was withdrawn because of leukopenia with a hypocellular marrow, and its administration was not started again until relapse occurred. Only one patient showed a second response. Administration of the drug was discontinued after 8 months of almost continuous administration in one patient because of severe anorexia and nausea. When this patient subsequently relapsed, 2 courses of 6-chloropurine therapy were given without beneficial effect.

Adequate courses of 6-chloropurine were given to 4 patients with chronic granulocytic leukemia. Three of these 4 patients responded to 6-chloropurine. Slight objective improvement was noted in 4 patients with lymphomas who were treated with 6-chloropurine, but improvement appeared only during the period of hematological toxicity when therapy had to be discontinued. A high incidence of jaundice was noted in the patients with acute leukemia and in the other patients treated with 6-chloropurine, but it is difficult to relate the occurrence of jaundice definitely to the therapy. While 6-chloropurine appears to be slightly superior to 6-mercaptopurine in acute leukemia in adults, the pattern of response would indicate that these agents have a similar mechanism and range of therapeutic activity.

Complementary Therapy of Cancer of the Cervix Uteri with Very High Doses of Testosterone Enanthate. M. Rossi, *I. Siliotti*, M. Giaquinto and others. Minerva med. 49:2355-2363 (June 13) 1958 (*In Italian*) [Turin, Italy].

Eight hospitalized patients with cancer of the cervix uteri, classifications 2 and 3, were each treated with 10 Gm. of testosterone enanthate, divided into 20 equal daily doses and administered intramuscularly. At the end of the treatment the following variations were observed: decrease in the erythrocyte sedimentation rate; increase in the azotemia level; decrease in the glycemia level; and slight decrease in the serum albumin level. The alpha-1 globulin level remained unchanged, but fractions of serum globulin alpha-2, beta, and gamma, increased slightly in value. The total serum protein value showed a slight increase, although it had been above the physiological limit even before the onset of hormonal therapy. There were no significant changes in the hepatic and cardiovascular functions. A clear improvement in well-being, appetite, body weight, and physical strength and a decrease in pain were observed. On macroscopic examination, the color and consistency of the tissues in the tumorous regions seemed improved, although no changes in the shape or in the total size of the tumors were noted. On microscopic examination, the histological and histochemical features of all the neoplastic masses remained unchanged; there was, however, evidence of slight reaction of the host tissues against the tumors, consisting in cornification and in necrotic processes of these tumors. Diminution in the serum acid phosphatase level also took place.

Untoward side-effects in the administration of testosterone enanthate consisted in the manifestation of certain features of virilism and in an increased sense of libido. The clitoris increased moderately in size in 6 patients, considerably in 1, and insignificantly in 1 after the dosage had reached 5 Gm. in each patient. Lowering of the pitch of the voice, which was noticed by each patient herself but was imperceptible to other persons, developed in 3 women. These variations did not produce unfavorable psychosensory changes in the patients. The patients were advised to continue with maintenance doses of the hormonal therapy after discharge. The authors believe that administration of testosterone enanthate is a useful complementary procedure to radiotherapy for management of inoperable cancer of the female genital organs.

PATHOLOGY

Importance of Staphylococcus Aureus in Pneumonia in the 1957 Epidemic of Influenza. A. L. Robertson, J. P. Caley and J. Moore. Lancet 2:233-236 (Aug. 2) 1958 [London].

The authors report on 140 patients, between the ages of 11 and 80 years, with pneumonia who were admitted to the City General Hospital in Sheffield, England, during the peak of the epidemic caused by the Asian variety of influenza, type A, virus in September and October, 1957. Results of bacteriological examination of sputum and autopsy specimens revealed that Staphylococcus pyogenes var. aureus was isolated from 38 (27%) of the 140 patients, Diplococcus pneumoniae from 12 (9%), and Hemophilus influenzae from 5 (4%). Eighteen of the 38 patients with staphylococci died, a mortality rate of 47%. Sixteen of the 102 patients without staphylococci died, a mortality rate of 16%. The over-all mortality rate among the 140 patients was 29%. There was no clear sex difference in either group. The strains of Staph. pyogenes var. aureus obtained from 12 of the 18 patients who died were sensitive to chlortetracycline (Aureomycin), chloramphenicol, penicillin, streptomycin, erythromycin, and sulfonamides; the strains of Staph. pyogenes var. aureus obtained from the remaining 6 patients were resistant to chlortetracycline, penicillin, streptomycin, and sulfonamides and sensitive to erythromycin and/or chloramphenicol. There was evidence that 13 of the 140 patients were infected in the hospital with strains of Staph. pyogenes var. aureus which were resistant to penicillin, chlortetracycline, streptomycin, and sulfonamides.

The treatment of the fulminating staphylococcic infections is very difficult, because it is necessary to treat both the bacterial infection and the attendant pulmonary edema and peripheral circulatory failure. Fourteen such patients died within the first week of admission to hospital, and all had been treated in hospital with massive doses of antibiotics, including erythromycin and chloramphenicol. Despite this treatment antibiotic-sensitive strains of Staph. pyogenes var. aureus were isolated from 12 of the patients at autopsy. In contrast, the less severely affected patients responded well to antibiotics, and those infected in the hospital with antibiotic-resistant strains responded well to the antibiotics indicated by the in vitro sensitivity tests.

Atherosclerosis and the Serum Mucoprotein Levels of the Australian Aborigine. C. J. Schwartz and J. R. Casley-Smith. Australian J. Exper. Biol. & M. Sc. 36:117-120 (April) 1958 [Adelaide].

The first of 3 groups of normal male subjects investigated was composed of 22 full-blooded male Pintubis living nomadically in the Western Desert of Central Australia and consuming essentially a simple bush diet. There were 21 full-blooded male Australian aborigines of mixed tribal origins in the second group, whose dietary and living habits more closely resembled those of the white people in the area. The third group consisted of 38 Australian males of European descent. These 3 groups, all of whom were healthy, normotensive, and without any clinical evidence of atherosclerotic disease or any other condition known to affect the serum mucoprotein levels, had a mean age of 32, 36, and 37 years respectively. The mean serum mucoprotein level of nomadic tribal Pintubis was found to be considerably lower than the mean level of the urban group of full-blooded detribalized aborigines and the mean level of a group of normal white Australians of comparable age. The latter differences are considered highly significant with p values less than 0.001. The differences between the detribalized aborigines and the white Australian controls is not significant. Atheroma is not found with either great severity or frequency in the Australian aborigines in contrast to the almost universal finding of extensive atherosclerosis in Australians of European descent. The fact that the urban group has a higher serum mucoprotein level than the nomadic Pintubi group precludes the possibility of an ethnic constitutional factor to account for the difference between aborigine and white Australian.

Natural History of Multiple Myeloma Before Radiological Evidence of Disease: Memorial Fund Lecture. E. F. Osserman. Radiology 71:157-174 (Aug.) 1958 [Syracuse, N. Y.].

In an attempt to support the theses that radiographically evident multiple myeloma usually has already progressed to an advanced stage and that the diagnosis of a proliferative disorder of plasma-cell origin is frequently possible by biochemical techniques before roentgen-ray changes are demonstrable, the author reports on 18 men and 6 women, between the ages of 46 and 82 years, with "dysproteinemia of the myeloma type." Serum protein electrophoresis revealed that the serum of these patients contained an abnormal protein at a time when there was neither clinical nor roentgenologic evidence of disease. The patients were followed for periods ranging from a few months to 3 years. Clinically and radiographically evident skeletal damage and disease patterns consistent with a diagnosis of myelomatosis developed in 2 of the 24 patients, and 1 of them died. Four additional patients died of causes other than those which could be directly attributed to primary plasma-cell proliferative disease. Autopsy was performed on 2 of these 4 patients, and microscopic examination revealed diffuse plasma-cell infiltration of the skeletal system, but no gross evidence of skeletal damage. Careful clinical, roentgenologic, and electrophoretic studies have been continued in the 18 surviving patients.

The concentration of abnormal protein has either remained constant or shown an increase. In none of these patients has a spontaneous decrease or a disappearance of the dysproteinemia been observed.

The patients included in this study had failed to satisfy the diagnostic criteria for one or another of the clinical variants of primary plasma-cell proliferation when they were initially examined. Patients with clinically evident para-amyloidosis, such as those with documented lymphatic dyscrasias and myeloma-type dysproteinemia, were specifically excluded, but it is quite probable that some of the patients still under observation will ultimately display one or another of these clinical patterns in which bone involvement is not a significant feature. The routine application of the technique of serum protein electrophoresis may, however, help in defining the earlier stages of plasma-cell proliferative disease, but it must be borne in mind that it is only after serum concentrations of 200 to 300 mg. per 100 cc. of an electrophoretically homogeneous protein constituent have been established that electrophoresis will ascertain its presence. In about 15% of patients with known myelomatosis there is no electrophoretically demonstrable dysproteinemia. These patients do, however, show an electrophoretically characteristic dysproteinuria. Possibly, routine urinary protein electrophoresis in patients with unexplained proteinuria might identify some of the cases of myelomatosis in an early stage.

Pathogenetic Importance of the Thoracic Portion of the Vertebral Column. H. Kamieth. Arch. orthop. u. Unfall-Chir. 49:585-606 (No. 6) 1958 (In German) [Munich, Germany].

The authors made a roentgenologic study of the thoracic spine in 100 patients with roentgenologically proved ulcers of the stomach and duodenum. The group included 83 men and 17 women. Sixty-one men and 11 women had duodenal ulcers; 20 men and 3 women had gastric ulcers; and the other 5 patients had both gastric and duodenal ulcers. Answers were sought to the following questions: 1. What morphologic and functional changes can be observed in the thoracic portion of the vertebral column? 2. What connections exist between the morphologic changes and the disturbances in the static functions? 3. Is it possible that the morphologic and functional changes will act as pathogenetic factors? The majority of patients (86 of 100) had lateral curvature scoliosis of the thoracic portion of the vertebral column, which, however, was essentially postural, since it could be compensated by forward flexion in two-thirds of the male patients and in about one-half of the female patients. A tendency to gradual fixation of the postural scoliosis was demonstrated by its appearance when a roentgenogram was made with the patient in the supine position. The convexity of the scoliosis was toward the right side in 60 of the patients and toward the left side in 21, and the remaining 5 patients had an S-shaped scoliosis. The percentile distribution of right-sided and left-sided scolioses coincided with the percentages of duodenal and gastric ulcers. All the scolioses involved the vertebral segments corresponding to the stomach and duodenum, that is, T-6 to T-9. The scolioses were mild, some being so slight that they could hardly be differentiated from variations within the normal range.

Spasticity of the musculature of the back was present in all but 17 of the 100 patients. Moreover, almost 90% of all the patients had pathological changes on the intervertebral disks. These disk changes and their relationship to osteochondrosis of the vertebrae, to Schmorl's nodules, and to spondylitic processes are discussed. On the basis of diagrams the author explains the pressure, shifting, and rotational forces that are most important in the production of the functional changes in the intervertebral disks. Spatial infringement in the intervertebral disk canals seems to be of vital importance, and this contraction of the canals seems to be a complex process, in which morphologic and functional, as well as nerve root, changes may play a part. It has not been definitely proved whether these various space-infringing factors or disturbing influences act directly on the nerve roots or indirectly by way of stasis and edematous changes in the intervertebral disk canals. There is also a possibility that the ligamentous apparatus, as well as the disks at the nerve roots, play a part. Morphologic-osteogenic changes seem to be less important than functional-dynamic changes. At any rate processes in the vertebral column seemed to play a part in 90 of the 100 patients with peptic ulcers.

A Histochemical Evaluation of Carcinoma in Situ of the Cervix Uteri. R. E. L. Nesbitt and A. R. Stein. Surg. Gynec. & Obst. 107:161-168 (Aug.) 1958 [Chicago].

The present study comprises a histological and cytochemical appraisal of cervical tissue obtained from 42 patients with carcinoma in situ, admitted to the gynecologic service of the Albany (N. Y.) Hospital during the 8-year period from 1947 to 1955. The diagnosis was established by cervical biopsy in 31 cases, the lesion being identified in the remaining 11 cases in uteri surgically removed because of leiomyoma, adenomyosis, diffuse pelvic endometriosis, and chronic salpingitis. In addition to the material obtained by biopsy, the uteri of 26 of these same patients were subsequently available. The periodic-acid Schiff procedure proved to be the simplest and most reliable of the staining techniques for demonstrating the basement membrane beneath the cervical epithelium. The presence of intracytoplasmic glycogen in normal cervical epithelial cells and its absence in neoplastic cells is the biochemical basis of Schiller's iodine tinctorial test. The periodic-acid Schiff method was useful not only in identifying the basement membrane but also in determining objective invasion, as well as in evaluating the degree of maturation and differentiation of cervical epithelium. Carcinoma of the ectocervix is a distinct entity characterized by atypical basal-cell hyperplasia with a failure of cell maturation. This lesion when present in the endocervix results from reserve-cell hyperplasia with absolute failure in differentiation as well as in maturation. Basal-cell hyperactivity, atypical hyperplasia, and bizarre forms of squamous-cell metaplasia can readily be differentiated from carcinoma in situ by determining the stainability of the abnormal epithelium with the periodic-acid Schiff procedure and noting the degree and extent of cellular atypia. Histological variants in the form of basal-cell hyperplasia and atypical hyperplasia with delayed or irregular maturation in the intermediary epithelial zone were found infrequently. The latter lesion is predominantly a prickle-cell type and appears in both the ectocervical and the endocervical regions. The authors attempt to correlate the cellular changes and the biological characteristics of carcinoma in situ with a view toward standardizing the diagnostic criteria.

Immunity in Experimental Tuberculosis. B. K. Acharya, F. M. Sullivan and J. M. Robson. Am. Rev. Tuberc. 78:203-225 (Aug.) 1958 [New York].

The method of immunizing mice with an intracorneal or intradermal injection of mycobacterium tuberculosis, and challenging the animals by a subsequent intracorneal inoculation, was used by the authors to study quantitatively the development of immunity to tuberculosis. The immunity resulting from a previous vaccination was assessed by the development of macroscopic lesions and the extent of bacillary multiplication in the challenged eye. It was found that some degree of immunity could be shown with a challenge given 48 hours after vaccination and that the immunity gradually increased to a maximum about 1 month after vaccination. At this stage a small inoculum (about 500 organisms) underwent no multiplication whatever in the challenged eye. Immunity sufficient to prevent the occurrence of any macroscopic lesions in challenged eyes was observed up to 13 months after vaccination, the longest period studied. The introduction of a larger challenge dose in immunized animals was followed by bacterial multiplication and the production of a macroscopic lesion; i. e., the larger challenge did overcome the immunity, although the extent of the multiplication lagged behind that observed with a similar dose of bacilli in nonimmune animals. Detailed microscopic investigation showed that, when a large inoculum overcame immunity, this was not due to insufficient phagocytic invasion and that under thees conditions intracellular multiplication of organisms, with ensuing destruction of the cells, did occur. The production of immunity with bacilli killed by various methods then was investigated. The best results were obtained with phenol-killed organisms which, in large doses, produced an immunity almost comparable with that seen with live organisms.

RADIOLOGY

Intravenous Cholangiography: An Appraisal. I. S. Goldenberg and A. J. Kummer. Connecticut M. J. 22:585-591 (Aug.) 1958 [New Haven].

Fifty-seven cholangiograms were done on 54 patients during the period from 1954 to 1957. Cholografin was utilized in all these studies, except in one patient in whom an additional study was done with Intrabilex. All the studies were completed without incident save for a 55-year-old woman in whom a probable sensitivity reaction occurred. In 29 patients intravenous examination was necessary to evaluate upper abdominal symptoms after cholecystectomy. Symptoms suggestive of biliary tract disease were present in 10 patients in whom oral cholecystograms with Telepaque had been accomplished without visualization. In 18 patients both oral and intravenous methods were employed, because initial visualization with the oral technique had proved inadequate. It is of note that of 15 patients who failed to reveal visualization after single-dose and double-dose Telepaque administration 9 had good intravenous Cholografin visualization after oral and intravenous techniques, and in only one case was visualization better after oral Telepaque administration than after intravenous Cholografin. Three of the 7 patients presenting jaundice had the duct system visualized. Forty-two cholangiograms in which the biliary radicles were visualized were available for critical evaluation. Maximum concentration of injected material occurred in from 40 to 70 minutes in two-thirds of these patients, maximum density occurring in 3 patients in less than 40 minutes after injection and in 10 patients only after 70 minutes had passed. Of the total group of examinations done, 30 were interpreted as being normal insofar as visualization of the biliary system was concerned. Twelve studies demonstrated definite abnormalities, which included cholecystolithiasis in 6, choledocholithiasis in 2, and common duct obstruction in 2.

Only 10 patients in the present group had operative intervention after the intravenous cholangiogram. Pathology found at operation confirmed the intravenous study in 8 patients. In 5 patients in whom Cholografin studies revealed a cholecystolithiasis or choledocholithiasis, such stones were found at operation. An enlarged common duct was found at operation in 2 patients in whom it had been previously demonstrated, and in 1 patient in whom no stones were seen on intravenous study none were found at operation. Two patients had no apparent stones by roentgenography, but at operation they were found to have stones in the common bile duct and in the gallbladder. The authors consider intravenous cholangiography a good procedure but believe that it should be reserved for patients who are symptomatic and in whom all other methods of visualization of the biliary tract have failed, because, despite the infrequency of reactions to the injection medium, deaths have been reported.

ANESTHESIA

Hypothermia in Thoracic and Thoracoabdominal Surgery: Use of Light Cooling as an Adjunct to Anesthesia in Poor Risk Patients. L. A. Brewer and E. L. King. Am. J. Surg. 96:137-150 (Aug.) 1958 [New York].

The authors report on 18 patients, between the ages of 34 and 77 years, who were subjected to thoracic and thoracoabdominal surgery. Six of these patients had bronchogenic carcinoma; 6, carcinoma of the esophagus; 1, bilateral pulmonary tuberculosis; 1, chronic emphysema and calcification of the pleura; 1, benign stricture of the esophagus; 1, malignant teratoma of the mediastinum; 1, teratoma of the epicardium; and 1, multiple fractures, ruptured diaphragm, and sepsis. These patients were considered poor risks for conventional normothermic anesthesia, and extensive thoracic and thoracoabdominal surgery was performed on them with the aid of light hypothermia, i. e., the patient's body temperature was lowered to 33 to 30 C (91.4 to 86 F) by packing with ice. Premedication included small doses of barbiturates, meperidine (Demerol) hydrochloride, and atropine or scopolamine. The patients represented about 5% of this type of patients operated on by the authors during the same period. The indications for hypothermia were as follows: (1) cardiac conditions, including previous infarction, auricular fibrillation, myocardial insufficiency, and cardiac failure; (2) respiratory conditions, including low maximum breathing capacity and pulmonary reserve from various causes resulting in an actual or threatening hypoxic state; (3) generalized arteriosclerosis; (4) hepatic or renal insufficiency; (5) trauma; and (6) infection.

The most striking finding during surgical intervention was a bright red oxygenation of the blood and a slow, firm cardiac beat. A light anesthesia was maintained with high-oxygen concentration by means of small amounts of ether and/or nitrous oxide. Three patients, all undergoing esophagectomy, did not survive the postoperative period; death was caused by cerebrothrombosis in 1 patient on the 3rd postoperative day, by a cerebral embolus in 1 on the 5th postoperative day, and by delayed cardiovascular collapse in 1 on the day after surgical intervention. The advantages of light hypothermia appeared to be better oxygenation of the blood in the course of the surgical intervention, need of only small amounts of anesthetic for long operations, and less stress of operation. The disadvantages were low blood pressure during phases of surgery, cardiac collapse on mediastinal dissection, and delayed postoperative shock or cardiovascular collapse. With the light hypothermia used in this group of patients, ventricular fibrillation did not occur in any of the patients. Temperatures below the levels used are dangerous with present-day methods and probably unnecessary. Children and young and middle-aged adults tolerate light hypothermia quite well. Older patients (above 60 years of age) show more cardiac reflex sensitivity in the course of the operation and a greater incidence of delayed postoperative shock. The final place of light hypothermia cannot be stated at present. Because of the favorable results in these patients, which could not have been duplicated with the aid of normothermic anesthesia, further trial is definitely indicated.

PHYSIOLOGY

Hyperexcitability of the Pulmonary Sensory Endings in Asthmatic Subjects: Its Measurement, Characteristics, Causes, and Role as a Reflex Asthmogenic Factor. R. Tiffeneau. Presse méd. 66:1250-1252 (July 12) 1958 (In French) [Paris].

Acetylcholine administered by the respiratory route in aerosol form has a twofold action: 1. It excites the pulmonary motor effectors (the smooth muscles of the bronchi and the vessels, and the bronchial glands), bringing about bronchoconstriction which alters pulmonary ventilation and may lead to asthma. 2. It excites the pulmonary sensory nerve endings, giving rise to laryngotracheobronchial sensations and sometimes causing a tussigenic reaction. These two methods of action, which are pharmacodynamically distinct, are opposed by two elective antagonists: (1) atropine, which prevents excitation of the motor effectors, and (2) pentamethonium and hexamethonium, which prevent excitation of the sensory nerves but have no antagonistic effect on smooth muscle excitation.

The second or sensory-nerve-excitation method of action was used in studying and measuring the excitability of the pulmonary sensory nerve endings in 105 patients with asthma. The inhalation of an aerosol containing 100 mcg. of acetylcholine per liter often leads to cough in normal subjects, whereas inhalation of one containing only 30 mcg. of acetylcholine rarely does so. The excitability of a patient in whom cough is produced by a concentration of 100 mcg. may therefore be regarded as normal, while that of one who coughs on inhaling a solution with a concentration of only 30 mcg. may be regarded as abnormal. Application of this criterion to the findings obtained in these patients showed that the excitability of the pulmonary sensory nerve endings was greatly increased in 25 (23.8%) and moderately increased in 39 (37.1%). Acute diseases of the lungs, which are frequent in asthmatic subjects, probably help to increase the excitability of the pulmonary sensory nerve endings. Ordinary bronchitis and even a simple cold often cause a temporary increase in this excitability in both asthmatic and normal subjects. Moreover, the excitability of the sensory nerve endings tends to increase as the asthmatic condition worsens, as shown by the correlation between an increase in cough, expectoration, and sensitivity to exogenous irritants and a diminution in pulmonary function, on the one hand, and an increase in excitability, on the other.

The hyperexcitability of the pulmonary sensory nerve endings may become an asthmogenic factor by giving rise to a bronchoconstrictive reflex. Cold air and irritating particles carried by the wind serve to precipitate this bronchoconstrictive reflex. Study of the dyspneic manifestations of asthma seems to show that there is a similarity between irritating particles and allergenic particles: both are carried by the air, and both are an indirect cause of bronchoconstriction, the first through the intervention of a reflex, the second through that of a mediator (histamine). Allergenic aggression predominates in recent forms of asthma; irritating aggression, in asthma of longer duration. The two factors, however, may occur together, producing mixed dyspneic reactions as a result of the twofold irritant and allergenic effect on the lungs.

PUBLIC HEALTH

Preliminary Report on Mass Vaccination of Man with Live Attenuated Poliomyelitis Virus in the Belgian Congo and Ruanda-Urundi. G. Courtois, A. Flack, G. A. Jervis and others. Brit. M. J. 2:187-190 (July 26) 1958 [London].

The authors report on 244,596 inhabitants of the Belgian Congo and Ruanda-Urundi, of both sexes and all ages, who were vaccinated during the years 1957 and 1958 in the course of trials with live attenuated Chat strain, type 1, poliomyelitis virus by the oral route. Of these 244,596 persons, 2,511 received, in addition, Fox III strain, type 3, of attenuated poliomyelitis virus. The virus pools representing each strain were tested for lack of virulence in rhesus monkeys injected intracerebrally and intraspinally and in chimpanzees injected intraspinally. None of the intracerebrally injected monkeys and intraspinally injected chimpanzees showed signs of illness. Some of the monkeys injected intraspinally with the undiluted material showed signs of poliomyelitis infection. For additional testing, aliquots of each pool were injected into rabbits, mice, and guinea pigs in order to rule out the presence of other viral agents, such as the Coxsackie viruses. Although the material was filtered through bacteria-retaining filters, rigid tests for bacterial sterility were completed before the virus pools were used in man. The efficiency of each virus preparation was finally checked by feeding the virus to a small group of infants and adults in the United States. These persons had no antibodies against the type of virus administered, and there was no reaction of any kind. This procedure made it possible to determine the minimum immunizing dose of the virus, which was $10^{3.7}$ TCD_{50} for nonimmune children and adults and $10^{5.0}$ TCD_{50} for infants less than one month old. The virus preparation was administered in either capsule or liquid form. The approximate minimum dose fed to each individual was $10^{5.3}$ TCD_{50} of each strain. Throughout the period of administration the container of virus suspension was kept at 4 C. Immunization of the total population of the community was decided on only if 12% or more of the serums collected were found to have no antibodies against a given type of virus. Since type 1 virus was incriminated in most outbreaks of paralytic poliomyelitis, including those in the Belgian Congo, it was decided to give priority to vaccination with attenuated Chat strain, type 1, virus wherever it was statistically feasible.

In 2 localities, Aketi and Stanleyville, no signs of illness were observed after administration of the 2 types of viruses, and in almost 100% of the vaccinated persons antibodies against the 2 types developed which were determinable in the serums. No illness, which could be attributed to vaccination, was reported by medical authorities in a third locality, the Ruzizi Valley, after mass vaccination trial of Chat strain, type 1, poliomyelitis virus. On recommendation of the Expert Committee on Poliomyelitis of the World Health Organization, this live virus was administered orally during 4 outbreaks of paralytic poliomyelitis at Banalia, Gombari, Watsa, and Bambesa in the Belgian Congo. After vaccination no more cases of paralysis were reported in these localities.

BOOK REVIEWS

Diagnostic Anatomy. By Weston D. Gardner, M.D., Associate Professor of Anatomy, Marquette University School of Medicine, Milwaukee. Cloth. $10. Pp. 376, with 20 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

Diagnostic anatomy is a new concept in an anatomy textbook, and the author is to be congratulated on presenting this type of book. The object of the monograph is to link the book with the physical examination of the patient. It is felt that a correlated approach to certain aspects of regional gross and topographic anatomy, based on the techniques, sequence, and problems faced by the physician in the physical examination, should be helpful to the student or practitioner who wishes to reacquaint himself with the anatomic features of the body he examines. The book is well written and easy to read. The printing is excellent. The illustrations, which are by the author, are line drawings demonstrating the desired points. It is regrettable that there are not more of them. Although the author states that surgeons are generally more anatomy-conscious than other physicians because they are concerned with anatomic dissections, the monograph should be valuable even to a surgeon, but it should be particularly valuable for those practitioners who come in contact with the anatomic structure of the body less frequently than surgeons. The book should be valuable also to students, especially in their course in physical diagnosis.

The Esophagus: Medical and Surgical Management. By Edward B. Benedict, M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Harvard Medical School, Boston, and George L. Nardi, M.D., F.A.C.S., Clinical Associate in Surgery, Harvard Medical School. Foreword by Edward D. Churchill, M.D., F.A.C.S. Cloth. $15. Pp. 390, with 124 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6; J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London, W. 1, England, 1958.

This is a Boston book from cover to cover. That is all to the good, since the authors are surgeons and teachers of surgery in the Massachusetts General Hospital and Harvard Medical School. With thoracic surgery well established, it is amazing what advances have been made in a short time. The chest used to be a *noli me tangere.* One felt rather proud to make a diagnosis of cardiac, pulmonary, or esophageal lessions that could be confirmed at autopsy. Although we are still clamoring for early diagnosis so that surgery can have a better chance for cure, surgical conditions in the esophagus are not yet brought to the attention of the surgeon soon enough. The authors rightfully insist that difficulty in swallowing is a primordial and highly important symptom of carcinoma, but both patient and physician speak of indigestion, spasm, and a "funny feeling" behind the breast bone. No better phrase has originated in this century than "cancer alert." Both x-ray and direct vision with the esophagoscope are helpful in making an early diagnosis. Hence, we now have a better idea of short esophagus, varices, strictures, foreign bodies, and ulcers. The literature on the esophagus is filled with monographs on various conditions, but, since it is difficult to look up so many references, having the etiology, symptoms, pathology, complications, and treatment all under one cover is a great help to the physician and especially the gastroenterologist. What to do must always require careful judgment. How to do it is well illustrated by the numerous and excellent drawings, photographs, and color plates in this book.

Reflexogenic Areas of the Cardiovascular System. By C. Heymans, M.D., Professor of Pharmacology, University of Ghent, Belgium, and E. Neil, M.D., D.Sc., John Astor Professor of Physiology, University of London, Middlesex Hospital Medical School, London. Cloth. $10. Pp. 271, with 89 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6, 1958.

The senior author of this book is a Nobel prize laureate and the discoverer of the chemoreceptor action of the carotid and aortic bodies. This book gives not only a critical evaluation of the physiology of the sinoaortic receptors but also a survey of cardiovascular reflexes in an attempt to correlate the latter with definite receptors characterized by anatomic localization and physiological function. Although the bulk of the work is based on the discussion of physiological investigations, the anatomic and embryologic basis is adequately covered. The problem of neurogenic hypertension (resulting from elimination of the sinoaortic receptors) is dealt with in a brief chapter. There is much material in this book of great value to investigators interested in cardiovascular physiology, respiration, and the neurophysiology of receptors. The text is well printed and provided with excellent illustrations, an extensive bibliography, and a short index. Since parts of the book are difficult to read, it is regrettable that there are no summaries. Criticism is frequently presented with unusual vigor. Certain data in the literature are found to be "exasperating."

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

The authors speak of the "illogicality" of an argument and say that even Claude Bernard "rashly concluded." On the other hand, with reference to his own work, the junior author writes (p. 184): "Recently Green and Neil (unpublished) have proved." These are unfortunate defects in an important book. They are mentioned because they are bound to weaken the trust in the arguments of the authors.

Neuropathology. By J. G. Greenfield, M.D., F.R.C.P., LL.D., and others. Cloth. $20. Pp. 640, with illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; Edward Arnold (Publishers) Ltd., 41-43 Maddox St., London, W. 1, England, 1958.

This admirable volume of neuropathology appeared shortly after the death of the senior author, who was one of the world's outstanding neuropathologists; it is a vade mecum for those who wish to work in this interesting area. The book is easy to read, and its style is especially attractive. Greenfield expended great care in presenting details. He brought neuropathology back to being primarily concerned with the nervous elements of the nervous system. There is often, in neuropathology, a temptation to be distracted from the consideration of the nervous elements. This distraction is engendered by the impressiveness of the changes in supporting tissues. Greenfield points out in the introduction to the first chapter that the changes in glial cells and the inflammatory changes are really only secondary and that the primary concern is what happens to the neuronal elements and their processes. This is an indication of clear thinking and putting first things first. This volume is well illustrated with gross and microscopic pictures. The illustrations are all black and white but are so vivid that one can not criticize the lack of colored photography. A minor criticism of the book is that the illustrations are numbered in a rather unusual fashion, so that one has to use some care in finding the proper illustration. This book should be of great value to all serious students of pathology or of the nervous system.

Religious Doctrine and Medical Practice. By Richard Thomas Barton, M.B., B.S., M.D. Foreword by Raymond B. Allen, M.D. Cloth. $3.75. Pp. 94. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book is "designed to provide a reference for questions of religious dogma as they pertain to the practice of medicine." The author had the advice of members of the religions about which he writes. Consequently it may be assumed that there are no gross errors of dogma or its application, but so short a book must necessarily be limited to a consideration of only a limited number of matters—those considered by the author to be of major importance. Religious principles are discussed with the religious interest of the patient in mind. The book will serve a useful purpose if it does no more than remind the physician or nurse that the patient may have religious obligations or wishes the observance of which will not interfere with, but on the contrary may aid, medical care. It should, however, not be accepted as an authoritative treatise for the interpretation of religious dogma. The book contains a brief readable history and a brief discussion of some of the principle doctrines and practices of Hinduism, Buddhism, Judaism, Islam, Bahai faith, Roman Catholicism, Christian Protestantism, Mormonism, Jehovah's Witnesses, Seventh-day Adventism, Disciples of Christ, Christian Science, and Unitarianism.

Obstetrics and Gynecology. By J. Robert Willson, M.D., Professor and Head of Department of Obstetrics and Gynecology, Temple University School of Medicine, Philadelphia, Clayton T. Beecham, M.D., Clinical Professor of Obstetrics and Gynecology, Temple University School of Medicine, Isador Forman, M.D., Clinical Professor of Obstetrics and Gynecology, Temple University School of Medicine, and Elsie Reid Carrington, M.D., Assistant Professor of Obstetrics and Gynecology. Temple University School of Medicine. Cloth. $10.75. Pp. 605, with 267 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

This book is the outgrowth of a mimeographed summary of the contents of courses in obstetrics and gynecology given to third-year and fourth-year medical students. The authors wrote the book to occupy a place between the large encyclopedic textbooks and the synopses devoted to these subjects. In this book, the authors have tried to include the essentials of obstetrics and gynecology and in this have largely succeeded, but, as may be expected when four experienced teachers write one book and the amount of space devoted to each subject is limited, there is sketchiness and unevenness. There are 51 chapters, each of which has a list of references at the end. The illustrations are abundant and instructive. Many have been borrowed from books written by Willson and the late Paul Titus. The advice given throughout the book is excellent and conservative. This is to be expected, because all four contributors are authorities in their specialties. This book should appeal to medical students, interns, and residents as a handy reference book for detailed information about obstetrics and gynecology. General practitioners and surely specialists will have to use the larger textbooks.

QUESTIONS AND ANSWERS

SLEEPING POSITIONS OF CHILDREN

To the Editor:—*Please comment on the advantages and disadvantages of having infants and children, normal or with upper or lower respiratory infection, lie on the stomach (postural drainage) for short or long periods of time. Is there any possibility of deformation of the thoracic bony structures in these infants?*

P. E. Gauthier, M.D., Montreal, Canada.

Answer.—The majority of infants sleep on their stomachs routinely, as they seem to rest more comfortably in this position. Older children sleep in a variety of positions. Children of any age will sleep more comfortably on their stomachs when they have the ordinary upper and lower respiratory infections. It is thought that this is due to the benefits of postural drainage. During the acute phase of pneumonia and other more severe lower respiratory tract infections, children are usually more comfortable in a partial Fowler's position. Once the acute phase has passed and secretions become more of a problem than gas exchange, postural drainage seems to be helpful. There is no evidence that sleeping on the stomach will influence in any way the development of the thoracic cage. There have been some suggestions that this position may predispose to positional deformities of the lower extremities. However, most pediatricians, after watching many children grow perfectly normally, feel that there is absolutely no connection.

Answer.—The normal infant and child should be given the freedom to assume any position in recumbency, i. e., prone, supine, or on either side. There is no basis for the thought that such practice will contribute to "deformation of the thoracic bony structures." When lower respiratory infections prevail, coughing is a defensive mechanism. The prone position in this instance is a significant advantage for drainage. The duration of such infections is usually not prolonged, and the time spent in the prone position does not promote the development of thoracic deformities. The incidence of tuberculosis of the spine in childhood is now very low. When present, recumbency is still indicated for a few months. For alternate hours the patient necessarily remains in the prone or supine position in some form of apparatus to restrict motion of the spine. In such cases there is a tendency for the thorax to lose its normal contours, i. e., the anteroposterior diameter may become less and the transverse diameter proportionately increased. Such a change may be retarded or prevented by the use of anteroposterior plaster shells.

BROMHIDROSIS

To the Editor:—*A 55-year-old man says his wife, and apparently several other persons, have noticed a peculiar odor over his forearms, hands, and shoulders. This is not a matter of personal cleanliness, as the odor may be apparent immediately after bathing. The odor has been described as fishy, musty, and like that of sardines or lutfisk. He has been examined exhaustively, and nothing of note has been found. Liver and renal function are both adequate. When the odor is present, it usually persists several hours and fades gradually.*

William A. O'Brien, M.D., Minneapolis.

Answer.—Bromhidrosis is the name applied to excretion of malodorous perspiration. This may resemble many of the unpleasant odors encountered in nature. Offensive odors may be noted in certain systemic diseases associated with excessive perspiration and in generalized dermatoses in which there is an admixture of scales, crusts, pus, bacteria, and necrotic material. Another form is exogenous in origin and is due to the ingestion of certain drugs and foods. In such instances, the use of garlic, onions, and other seasonings should be avoided. Perhaps the "fishy" odor in this patient is suggestive of the causative factors, and he should avoid the ingestion of all fish and seafoods. The normal perspiration, both exocrine and apocrine, is devoid of any strong odor. According to Shelley and others (*A. M. A. Arch. Dermat. & Syph.* 68:430, 1953), the action of bacteria on apocrine sweat produces the olfactory changes. In such instances, the odor can be prevented by hexachlorophene for as long as 18 hours. In one case, famous in dermatological annals, such an offensive odor in a patient was found to be due to a ring that he was wearing and elimination of the ring resulted in a permanent cure. The unpleasant odor may or may not be associated with hyperhidrosis. The treatment in this patient should be directed against bacteria with use of detergents containing hexachlorophene, and application of anhidrotics (such as aluminum chloride) and avoidance of malodorous ingestants (fish) should be tried.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

BLOOD EXAMINATIONS WITH OXALATED BLOOD

To the Editor:—*It is a common practice for the technical staff to draw venous blood between 8 and 9 a. m. for chemical examination, determination of erythrocyte sedimentation rate (Wintrobe), and, frequently, complete blood cell count. An oxalate mixture is used as the anticoagulant in a vacuum tube. The blood is examined within 30 minutes after arrival in the laboratory. No platelet counts are done in this fashion. Does this technique give clinically useful results in regard to the complete blood cell count?* *H. Seibel, M.D., Brooklyn, N. Y.*

Answer.—The technique described is probably adequate for the determination of red blood cell counts and hemoglobin level. The resultant white blood cell count is probably somewhat lower because of the rupture of white cells in the vacuum tube. The technique would not be satisfactory for good blood films in part because of destruction of white blood cells and in part because of the unsatisfactory stain after the use of anticoagulants. Because of the effect of the oxalate, the hematocrit reading would also probably be inaccurate. In comparing results, it must be remembered that blood obtained in this fashion is venous blood and the results are not entirely comparable with the capillary blood obtained by finger puncture. The results, however, would be comparable when obtained by the same technique consistently.

ARTIFICIAL SWEETENING AGENTS

To the Editor:—*It has recently been said that the prolonged use of no-calorie sweeteners was harmful. What harmful effects might result from such use in general?* *M.D., Tennessee.*

Answer.—The conclusion of a report published by the Food Protection Committee of the Food and Nutrition Board (National Research Council, August, 1955) can be taken as reflecting the current attitude concerning the use of artificial sweetening agents: "There is no evidence that use of the nonnutritive sweeteners, saccharin and cyclamate, for special dietary purposes is hazardous. In the case of cyclamate, unrestricted use in foods and beverages may result in the formation of soft stools, but probably without interference with other functions of the intestine and without hazard to health. No data have been presented as to the minimum laxative dose of cyclamate for children, but it is reasonable to assume that this dose is lower than for adults. The maximal amount of saccharin likely to be consumed is not hazardous. No adverse synergistic effect was observed in combinations of saccharin and cyclamate as tested. These materials should be subject to continuing observation for possible deleterious effects under prolonged and varying conditions of use and should be reappraised whenever indicated by advances in knowledge."

ANTICOAGULANT THERAPY

To the Editor:—*A 65-year-old man has moderate essential hypertension and generalized arteriosclerosis. He recently had a mild cerebrovascular accident, characterized by paresis of the right upper and lower extremities, and is gradually improving six weeks after the accident. Would it be advisable to institute anticoagulant therapy on a long-term basis for prophylaxis of further thrombotic episodes of the cerebral vessels? Also, would it be advisable to use rutin and one of the citrus flavinoid compounds?* *M.D., Ohio.*

Answer.—Anticoagulants should never be used in any form of therapy unless (1) the patient will consistently and scrupulously follow the doctor's directions and (2) accurate laboratory facilities are available to measure prothrombin time. There is no unequivocal evidence that treating elderly patients with generalized arteriosclerosis and hypertension will be of any value in preventing subsequent strokes, though there are enthusiastic supporters of this form of therapy. Direct treatment of the hypertension with methods aimed at lowering the blood cholesterol level and general hygienic care probably constitute the best available therapy at the present time. There is no evidence that flavinoids or rutin are of any value in the circumstances outlined or in other clinical conditions for which they have been recommended enthusiastically but not critically.

POLLEN FILTERS

To the Editor:—*Please give information and references on the most effective air-conditioning filter system for removal of pollen during hay-fever season, particularly the ragweed and grass pollens occurring in the Wisconsin area in June, July, August, and most of September.*

M.D., Wisconsin.

Answer.—There are numerous excellent filters on the market being used in air-conditioning equipment. It would be impossible to give an unbiased appraisal of any particular brand. Since ragweed pollen measures 15-20 μ in diameter, almost any good impingement filter would be effective to some degree. The Air Processing Committee (a subcommittee of the Committee on Air-borne Allergens) of the American Academy of Allergy has been studying this problem and testing filters and air-conditioning equipment for several years. In its most recent report (*J. Allergy* 28:455, 1957), a combination of an impingement type of filter in conjunction with an electrostatic precipitator type is recommended. Such devices have been described by

Novey and co-workers (*J. Allergy* 27:398, 1956) and Friedlaender and Friedlaender (*Ann. Allergy* 12:419, 1954).

USE OF OLD SURPLUS THIOPENTAL SODIUM

To the Editor:—*Does thiopental sodium deteriorate in the ampuls? A hospital recently acquired a supply of thiopental, a surplus item, which had originally been furnished to the U. S. Army in February, 1945. Is it safe to use it intravenously for anesthesia?*

Duncan C. McKeever, M.D., Houston, Texas

Answer.—This question is difficult to answer, since the factors concerned in the storage are unknown. However, tests on ampuls of this vintage only a year ago showed that the thiopental did not deteriorate to any great degree and that the toxicity did not increase with the passage of time when the ampuls were properly stored. Excessive heat and excessive light may accelerate deterioration, but more deleterious than this would be the minor breaks that occur in many types of ampuls. The skilled individual could make a solution of this particular vial, and, if it appeared to the naked eye to be normal, that is, if there was no clouding or precipitation, it would be considered safe to use. However, alterations in color and clarity would indicate that the ampul should be discarded.

PARALYSIS AGITANS

To the Editor:—*Is any form of paralysis agitans (Parkinson's disease) communicable?*

M.D., Pennsylvania.

Answer.—Paralysis agitans is not communicable. This clinical neurological syndrome may be the result of a wide variety of etiological agents. These agents include such infections as encephalitis and (rarely) syphilis. In most instances, paralysis agitans occurs long after initial infection, and transmission of the initial etiological agent is improbable at the time of the clinical manifestation of the disease syndrome.

VON GIERKE'S DISEASE

To the Editor:—*Please supply information on the use of pituitary extract to increase the growth of a 13-year-old boy with diagnosed Von Gierke's disease. His present height is 47 in. (88.9 cm.) and his weight 47 lb. (21.3 kg.). What other regimen of treatment might be of value?*

Henry G. Kurz, M.D., La Habra, Calif.

Answer.—The literature on this condition is not voluminous. The most illuminating article that has come to this consultant's attention is "Effect of the Menarche on Hepatomegaly in Pubescent Girl with Syndrome Resembling Glycogen Disease" (Esselborn and others, *J. Clin. Endocrinol.* 10:339, 1950). On the basis of this and general considerations, this boy could be given gonadotropins, either equine or chorionic or these in alternation, thyroid in tolerance doses, and methyltestosterone, 10 mg. sublingually twice daily; also, cortisone might be tried. None of these, nor all of them together, offer any great promise. Pituitary growth hormone should be useful when effective preparations are available.

PROGRESSIVE PIGMENTARY DERMATOSIS

To the Editor:—*A query on progressive pigmentary dermatosis appeared in* The Journal, *Aug. 23, 1958, page 2161. Current textbooks, such as those by Sutton, Ormsby, and Montgomery, do not touch on the etiology and pathogenesis of this condition, and only Sutton suggested the use of x-ray treatment. Progressive pigmentary dermatosis (Schamberg's disease) is due to a clear-cut deficiency of vitamin C, and, as such, it is an etiological equivalent of scurvy. The treatment with vitamin C, 150 mg. given three times a day until the lesions disappear, is efficient in every instance. In my experience, the patients with this disease had not had citrus fruits in their diet for years. This deficiency in the patient's diet should be, of course, eliminated.*

Tibor Benedek, M.D.
25 E. Washington St.
Chicago 2.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*The group of dermatoses to which progressive pigmentary dermatosis belongs, and which includes purpura annularis telangiectodes (Majocchi's disease), Gougerot's syndrome, and Blum's disease, is noted, among other changes, for purpura. The purpuric lesions are small and often punctate and yet unlike the early follicular forms seen on the lower extremities in scurvy. Overt manifestations of scurvy in the above group, such as swollen and bleeding gums, are lacking. Nevertheless, progressive pigmentary dermatosis and related entities (some believe they are clinical variants of one disorder) may have a direct or indirect basis in a relative vitamin C deficiency. This should be easily verified in the clinical laboratory. This consultant is not aware of any reports on blood vitamin C levels in progressive pigmentary dermatosis. If the simple measure of vitamin C administration will suffice to clear this group of purpuric dermatoses, it is a welcome therapeutic suggestion and will be received gratefully.*

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Doctor Cooperation in International Health Urged . .
AFL-CIO Gives High Priority to Welfare Bills . .
PHS Cites Disease Factor in Air Pollution . .
New Physician in Congress . .
Doctors on White House Group for Youth . .
Library of Medicine Gets New Regents . .

FIRST REPORT ON INTERNATIONAL HEALTH STUDY

A senate Government Operations subcommittee has made its first report on a broadscale study of "any and all matters pertaining to international health, research, rehabilitation, and assistance programs"—with particular reference to the U. S. contributions. Chairman of the group is Senator Hubert Humphrey (D., Minn.). The study was authorized by the last Congress.

The initial report which deals with medical research observes that "it is the hope of men of good will everywhere that more and more of the energies of all nations be channeled to the constructive purpose of furthering the well being of man." To this end, teamwork is essential from a number of groups. The report lists in this connection "the great system of private medicine and of all the members of the professions allied to medicine" and the private pharmaceutical and chemical industries "whose research contributions grow with each passing day."

It also called for teamwork between American foundations, voluntary health organizations, universities, and hospitals, as well as "between the governments of the nations of the world themselves."

"Today," the report added, "the complexity and volume of medical research render especially important the promptest possible exchange of scientific information and strengthened cooperation. In this way, precious time and effort may be saved and used to best advantage."

PHS CITES POLLUTED AIR AS DISEASE FACTOR

Public Health Service says it appears likely that the medical effects of air pollution are not confined to the respiratory and circulatory systems. In a pamphlet issued in advance of its National Air Pollution Conference, PHS says the theory is still unproved but supported by accumulating evidence that air pollution contributes significantly to mortality rates of many of the urban diseases, such as arteriosclerotic and heart conditions and cancer of the lungs, trachae, stomach, and esophagus.

Epidemiological and statistical studies show parallels between air pollution and mortality rates from cancer of the stomach and esophagus, similar to those from lung cancer, PHS said. Mortality rates for lung cancer among urban dwellers are significantly higher than among strictly comparable rural groups, smoking habits notwithstanding. Statistical studies now under way show possible parallels between lung cancer rates and air pollution indices, according to PHS.

Comments a second report on the economic effects of air pollution: "It is impossible to add up the cost of pollution in one column and the cost of an ideal pollution prevention program in another and prove the economy of maintaining a high quality of air. Nevertheless, it is quite apparent that the estimated third of a billion dollars now spent for prevention is out of line with the estimated 4 billion dollars spent for neglect. More money put into the asset side would remove several times as many dollars from the debit side."

Over 70 air pollution specialists, civic leaders, and representatives of industrial and governmental agencies dealing with air pollution problems are on the program on the National Conference. The conference will review recent knowledge about air pollution and recommend future plans for dealing with the problem.

Surgeon General Leroy Burney and HEW Secretary Arthur Flemming are the principal speakers. Others include Dr. Edwin D. Harrison, president, Georgia Institute of Technology; Chauncey D. Leake, American Association for the Advancement of Science, and Martin Agronsky, news commentator, who will summarize the conference discussions.

Public officials on the program are Senator Kuchel (R., Calif.), who developed the federal legislation on air pollution control; Mayor R. Tucker of St. Louis; Dr. Herman E. Hilleboe, New York state commissioner of health, and Dr. Malcolm H. Merrill, director of the California department of public health.

Speakers on the industrial role in air pollution control are Gen. John E. Hull, president of the Manufacturing Chemists Association; Max D. Howell, executive vice-president of the American Iron and Steel Institute; Harry A. Williams, managing director of the Automobile Manufacturers Associa-

(Continued on next page)

tion; and Dr. Jerry McAfee, chairman of the smok and fumes technical advisory committee of the American Petroleum Institute.

LABOR SEES ELECTION MANDATE FOR MORE WELFARE PROGRAMS

Hospitalization and surgical services for the social security beneficiaries are now no. 3 on the legislative agenda of the AFL-CIO, which says the recent elections calls for "bold forward steps for the welfare of all America." President George Meany has this to say in his 12-point legislative program:

"Adopt the Forand bill to provide hospital and surgical care for the recipients of old age and survivors insurance benefits. It is still either impossible or too costly for our senior citizens to obtain such insurance through non-profit or commercial channels."

Mr. Meany told a press conference: "By an overwhelming vote, they elected to Congress new Senators and Representatives who want to forge ahead and properly utilize our nation's human and natural resources to build a better world for all. By the same token, they retired many members of Congress who have followed a standstill policy."

He said the union was hopeful that "now that the people of America have spoken that prompt and vigorous action will result. This is not the time to raise false issues. This is the time to give the American people the program for which they have voted."

The two issues ahead of the hospitalization proposal are aid to depressed areas and adequate federal aid to general education.

NEW PHYSICIAN IN CONGRESS–TWO OTHERS LOSE

A physician new to politics has been elected to the House of Representatives, while a veteran physician member of the House will be assuming the chairmanship of the Foreign Affairs Committee. Two other doctors long in Congress lost out on reelection.

Dr. Dale Alford, a board ophthalmologist from Little Rock, Ark., is the new Democratic Representative from the fifth district of Arkansas. He is the son of a public school administrator, was educated in Arkansas schools, and received his medical degree from the University of Arkansas. Dr. Alford served in the Army Medical Corps in World War II and has been in active practice in Little Rock since 1948. He is 42.

Dr. Thomas Morgan (D., Pa.), who has completed 14 years in the House, is scheduled to become chairman of the Foreign Affairs Committee. According to committee sources, he would be the first physician chairman of that important committee in the 136 years of its existence.

Dr. Will Neal (R., W. Va.), who has been active on the health subcommittee of the House Interstate Committee, and Dr. A. L. Miller (R., Neb.), long on the Interior and Insular Affairs Committee, failed to be reelected. Back for another two years as a result of the voting are Drs. Walter Judd (R., Minn.) and Ivor Fenton (R., Pa.).

TWO DOCTORS ON WHITE HOUSE YOUTH CONFERENCE

Two physicians have been named among 12 leading citizens by the President to serve on the national committee for the White House Conference on Children and Youth. It will be held in March, 1960. They have the position of vice-chairmen.

One is Dr. Edward D. Greenwood, coordinator of training in child psychiatry, Menninger Foundation, Topeka, Kan. The other is Dr. Daryl P. Harvey, staff physician on the Howard Clinic, Glasgow, Ky.

Other vice chairmen are Hurst Anderson, Ph.D., president of American University; Mrs. James Blue, National Association of Governing Boards of State Universities and Allied Institutions; Robert E. Bondy, director, National Social Welfare Assembly; Erwin D. Canham, editor, Christian Science Monitor; Donald K. David, Ford Foundation; Msgr. Raymond J. Gallagher, Catholic Charities of Cleveland; Mrs. Frank Gannett, of Gannett Newspaperboy Scholarship Inc.; Donald S. Howard, chairman of the National Council of State Committees for Children and Youth; Rabbi Marc Tanenbaum, executive director of the Synagogue Council of America, and the Rev. William J. Villaume of the National Council of Churches of Christ.

President Eisenhower will serve as honorary chairman and Secretary Arthur Flemming of HEW as honorary vice-chairman. Mrs. Rollin Brown, past president of the National Congress of Parents and Teachers, is the conference chairman, and Mrs. Katherine B. Oettinger, chief of the U. S. Children's Bureau, is secretary.

LIBRARY OF MEDICINE REGENTS

Three regents who will serve four years have been named to the National Library of Medicine by President Eisenhower. At its first meeting of the fall, the board of regents elected as their chairman Dr. Champ Lyons, professor of surgery and chairman of the department of surgery at the Medical College of Alabama. Dr. Lyons has been on the board since 1956.

Two of the new regents are physicians. Dr. William B. Bean is professor of medicine and head of the department of internal medicine, State University of Iowa College of Medicine. Dr. William Stadel, a former hospital administrator, is director of the San Diego (Calif.) Department of Medical Institutions. The third regent is Mrs. Eugenie Mary Davie of New York, chairman of the women's auxiliary of the New York Republican County Committee since 1946.

Dr. Lyons succeeds as chairman Dr. I. S. Ravdin of Philadelphia, whose term has expired.

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 12 CHICAGO, ILLINOIS NOVEMBER 22, 1958

Copyright, 1958, by American Medical Association

ROLE OF URETER IN PATHOGENESIS OF ASCENDING PYELONEPHRITIS

Herbert S. Talbot, M.D., West Roxbury, Mass.

It is suggested that the ureter has a dual role in the pathogenesis of most cases of ascending pyelonephritis. Anatomically the ureter provides a direct route of invasion from bladder to kidney because the subepithelial tissues of the bladder, ureter, and renal pelvis are continuous with the interstitial tissue of the kidney. Physiologically the diseased ureter increases the susceptibility of the kidney to infection because ureteral dysfunction generally involves both obstruction and vesicoureteral reflux. The ureter is not an inert tube but an active muscular structure, and recognition of this fact leads to a dynamic, rather than a static, concept of ascending pyelonephritis.

PYELONEPHRITIS is a collective term applied to a number of different types of renal infection with varying manifestations.[1] It cannot be expected, therefore, that a single pathogenic process might be invoked to account for the evolution of the disease in every instance. Careful study of a group of similar cases, however, has suggested a sequence of events applicable to that group, from which conclusions may be drawn that perhaps have broader implications. This has included not only the correlation of clinical and pathological findings but also consideration of the pathological physiology of the urinary tract during the development and course of the disease.

For the purpose of this discussion, the term "ascending pyelonephritis" will be applied to those cases in which renal involvement is accompanied or preceded by infection in the lower urinary tract, from which it may reasonably be supposed to have been derived. Bacterial evidence of this relationship does not in itself indicate the manner in which the process has spread. It will be suggested that the ureter has an important role in this pathogenesis—a dual role—in that the wall of the ureter first provides a pathway for the actual ascent of the invading organism and, second, as a result of the changes which it undergoes during this process, exhibits a dysfunction which results in stasis, contributing further to the development of infection in the kidney. This concept, although independently reached, is not original,[2] but has not previously been emphasized.

There are four routes by which infection, originating in the bladder, might reach the kidney: (1) hematogenous, (2) lymphogenous, (3) through the lumen of the ureter, and (4) through the ureteral wall. Hematogenous pyelonephritis may occur, and be the only apparent secondary focus to de-

---

From the Urological Section and the Spinal Cord Injury Service, Veterans Administration Hospital.

Read before the Section on Urology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

velop, from a known primary site of infection. When this site is remote from the kidney, the blood stream is the most likely channel for the transmission of pathogenic organisms; gram-positive cocci are the usual invaders in such cases. With the original infection in the bladder, a question arises as to whether this roundabout course is more probable than direct invasion through or along the urinary tract itself. The most frequent pathogens are gram-negative bacilli, and they are rarely cultivated from the peripheral blood. Material for histological examination is seldom obtained at the early stage of disease when the route of invasion might be suggested by such evidence as perivascular infiltration, in the case of hematogenous infection. Biopsy findings, however, suggest that in the acute stage the primary reaction is tubular.[3] The dissemination and evolution of the intrarenal lesions is such as to obscure early changes and make it difficult if not impossible to differentiate one type of pathogenesis from the other. The fact that healed experimental pyelonephritis of hematogenous origin histologically resembles certain specimens obtained from human cases does not, therefore, imply that the human cases were also hematogenous.

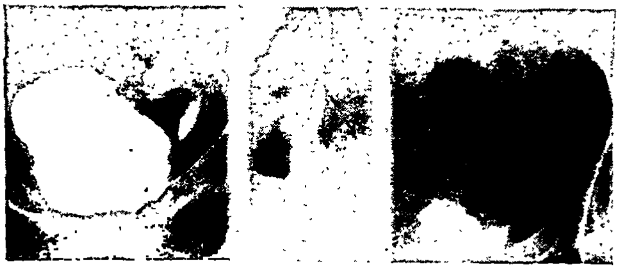


Fig. 1.—Vesicoureteral reflux with compensated ureteral function. With bladder full, there is reflux into left ureter; as bladder empties, ureter empties as well..

Oberling[4] has pointed out that the lesions of pyelonephritis are basically interstitial, whether ascending or hematogenous in origin, and that they are to be distinguished mainly by their distribution. In the ascending form, the infiltration develops in tracts running over considerable areas from the pelvis toward the capsule. They may be diffuse and uniform, but, more often, the lesions leave between them areas of undamaged parenchyma. In the hematogenous form, on the other hand, the inflammatory foci are more prone to form a subcapsular band with perpendicular tracts developing especially around the interlobular vessels, in accordance with the concept of a perivascular stroma particularly prompt to react to any irritative influence. This may occur as well with ascending involvement *when it has gone on long enough* to involve the same areas, thus obliterating any differences between the ascending and hematogenous types.

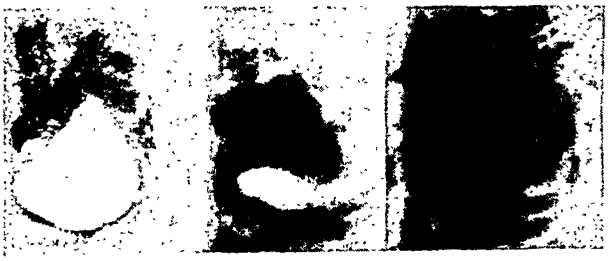


Fig. 2.—Vesicoureteral reflux with ureteral decompensation. Ureter is unable to empty with bladder.

Ureteral Obstruction

Mallory, Crane, and Edwards[5] showed that the production of experimental hematogenous pyelonephritis in previously healthy kidneys depends on the presence of partial ureteral obstruction. The clinical association of intermittent or chronic pyelonephritis with obstructive lesions of the urinary tract, and particularly of the ureter, has often been noted.[6] However the organisms reach the kidney, therefore, their capacity to do damage is considerably enhanced by, if it does not depend on, some degree of stasis of the urinary column. Certain bacteria, particularly staphylococci, injected intravenously may infect normal kidneys. De Navasquez[7] accomplished this with a coagulase-positive Staphylococcus pyogenes var. aureus and attributed the establishment of infection to coagulase production, which initially causes agglutination in the unusually long renal capillaries devoid of phagocytes; the sub-

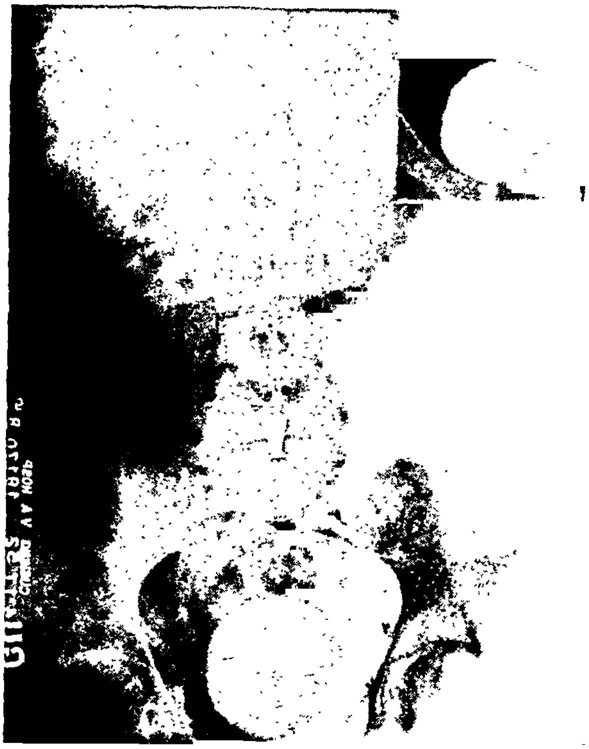


Fig. 3 (case 1).—Reflux into right ureter. Inset shows spot film demonstrating transitory reflux up left ureter.

sequent diffusion of coagulase into the surrounding parenchyma leads to coagulation necrosis, followed by suppuration. These factors do not operate in the case of the gram-negative bacillary organisms normally associated with urinary tract infections.

Asher and Sokol[8] demonstrated that blood-borne foreign particles have but a slight tendency to localize in the kidney, which, when normal, does not excrete living bacteria circulating in the blood. They observed, however, that acute experimental hydronephrosis increased the tendency for blood-borne particulate matter to localize, apparently as a result of stasis. Lucas[9] suggested that an increase in intrapelvic pressure has the effect of slowing down the circulation of blood through the kidney, producing some renal damage and favoring the trapping of organisms in narrow capillaries. In a later series of experiments, De Navasquez[10] injected coliform bacteria intravenously into rabbits which had recovered from the pyelonephritis previously induced by coagulase-positive Staph. pyogenes var. aureus, but with kidneys scarred as a result thereof. All developed a fatal pyelonephritis, while normal control animals developed no kidney lesions. He attributed this to the obstruction of tubular drainage by the scars, with resulting "intrarenal hydronephrosis," and increased local tissue pressure.

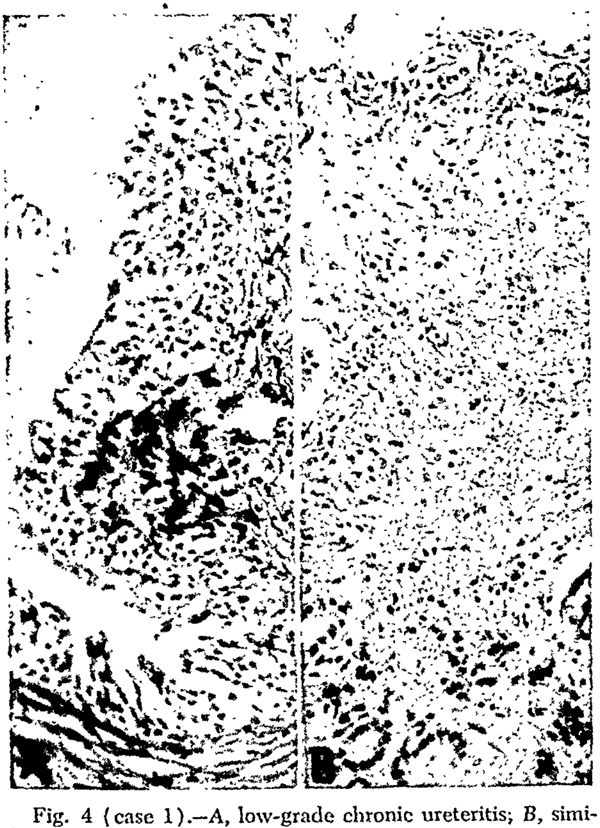


Fig. 4 (case 1).—*A*, low-grade chronic ureteritis; *B*, similar changes in kidney.

Beeson, Rocha, and Guse[11] found that small lesions in the renal medulla, produced by an electric cautery, render an entire segment of kidney tributary to the tubules passing through that portion of the medulla susceptible to coliform infection. This result was obtained whether the infecting bacteria were introduced via the blood stream or the urinary bladder. They agreed with the explanation offered by De Navasquez insofar as it postulated obstruction of tubular drainage, but could not accept his further suggestion that another element is local slowing of the circulation, since this did not appear to be the case in the pathogenesis of pyelonephritis in animals with ureteral ligation. If Lucas' contention that an increased intrarenal pressure produces slowing of the blood flow through the kidney is correct, however, such a factor might be significant. Whatever the precise mechanisms, it is apparent that trauma will favor the probability of invasion by any route. Braude, Shapiro, and Siemienski[12] accomplished this by massage of the exposed kidney in rabbits subjected to the intravenous inoculation of gram-negative bacilli. It has also been suggested that not only acquired pathological changes but congenital dysplasias as well may predispose the kidney toward infection.

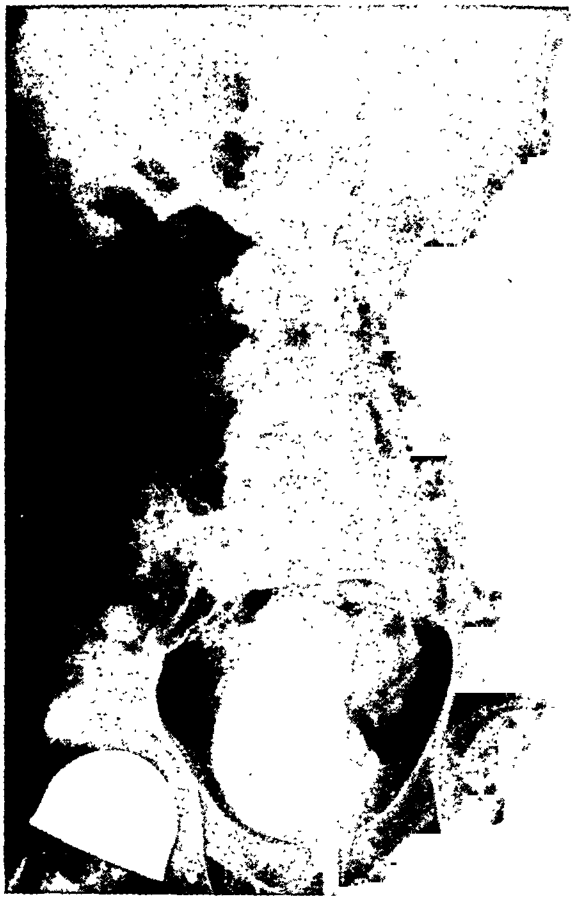


Fig. 5 (case 2).—Right reflux with hydronephrosis.

When there is a bacteremia during the course of a lower urinary tract infection, hematogenous infection may occur provided that at least one of two prerequisites has been met, a previously damaged kidney or obstruction of the ureter. In their absence, and lacking the further confirmation of a positive blood culture of gram-negative bacilli, such a pathogenesis is unlikely.

Lymphogenous ascent of infection from the bladder to the kidney has been suggested, and the possibility is supported by the frequent involvement of periureteral lymphatic channels. But Winsbury-White's demonstration [13] of the spread of india ink into these lymphatics from the bladder is not conclusive evidence that living organisms propagate along the same route. The major lymphatic drainage of the urinary bladder is into the pelvic and iliac chains. The periureteral lymphatics drain the ureter and renal pelvis, and a lymphangitis in this area may, therefore, be presumed to be secondary rather than to represent a primary invasion pathway.

Ascent of infection through the column of fluid within the ureteral lumen is at least theoretically possible and has been ingeniously demonstrated in an artificial urinary tract. In the experiments of Weyrauch and Bassett,[14] motile organisms ascended only in a stagnant column, however, or against a flow of less than 25 cc. per hour. Once again, therefore, an element of obstruction must be postulated. In the presence of such obstruction, it is difficult to conceive of pathogenic bacteria moving and multiplying within the lumen without attacking the wall of the ureter. But this is even more susceptible to invasion, by direct contiguity, from an infected bladder. The lamina propria or subepithelial layer is a continuous structure from the bladder to the renal pelvis where it merges with the interstitial tissue of the kidney. Rényi-Vámos [15] found this to be a pathway for the spread of infection in both human and experimental ascending pyelonephritis, an observation confirmed by others, usually with a reference to associated ureteral obstruction. Allen [16] refers to the ureter as being "obviously continuously infected from the site of obstruction upward to the kidney." The significance of such a pathway becomes apparent when its effect on ureteral function is appreciated.

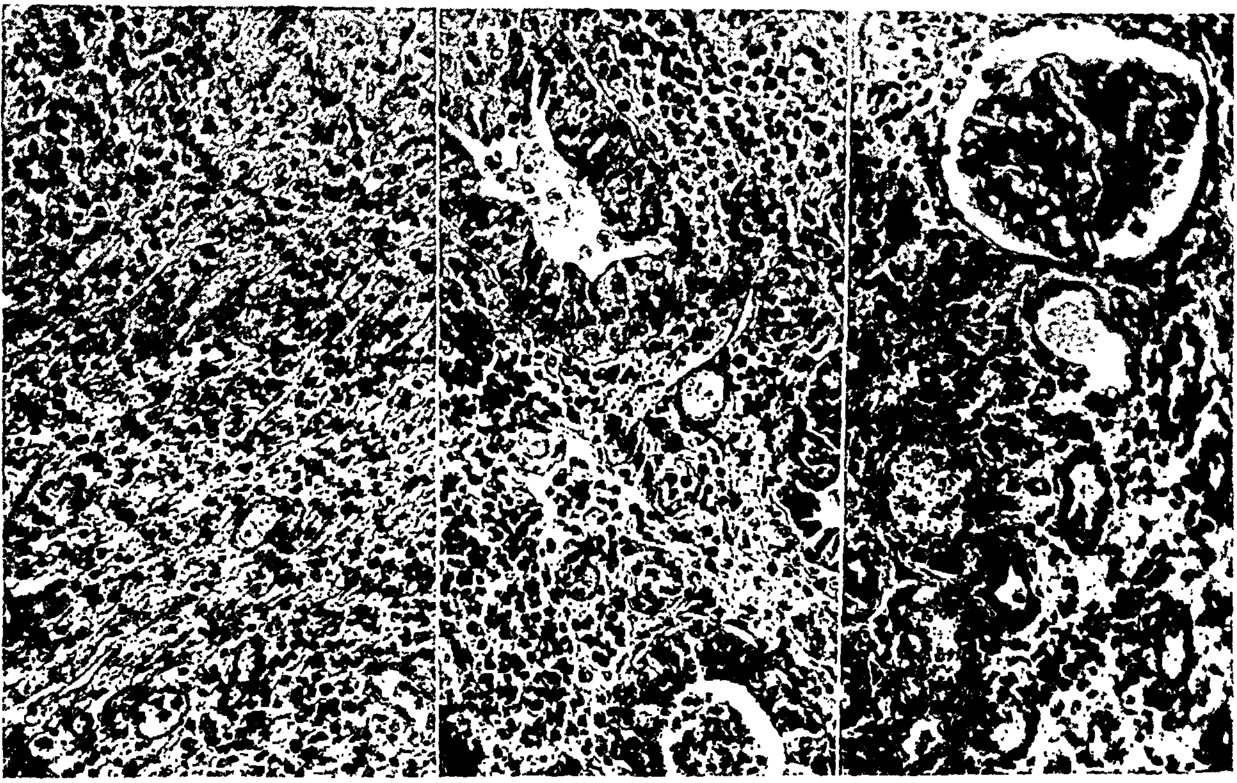


Fig. 6 (case 2).—*A*, midureter section showing ureteritis; *B*, similar findings in calyces of kidney; and *C*, cortex of kidney.

Role of Ureter in Pyelonephritis

Investigations into the normal and pathological physiology of the ureter, demonstrating its importance in the dynamics of urinary flow, lead to the concept that its disease and consequent dysfunction may contribute to the development of pathological changes in the kidney.[2] The significance of this in ascending infection was suggested by the study of pyelonephritis associated with vesicoureteral reflux in patients with spinal cord injury. In the review of a series of such cases, it was noted that dilatation of the ureter began at its lower end and advanced upward. In fact, such evidence of progressive disease is of greater prognostic importance than the demonstration of reflux itself, which is often capricious in its appearance and disappearance. It has been axiomatic to interpret ureteral dilatation as a consequence of obstruction distal to the dilated segment, but this raised two interesting considerations. First, mechanical obstruction was not demonstrated in any of the cases from which this study developed. It was evident that the obstructive factor, if any, must be functional rather than structural. Second, it was difficult to understand why an organ like the ureter, limited in length and draining a hydraulic system closed at its proximal end, should react to obstruction by dilatation involving only a short segment. Dilatation of the whole system proximal to the obstructive lesion would have seemed likelier; this is observed when a stone becomes impacted in a previously healthy ureter, as well as in other types of mechanical obstruction, when there is no infection.

It thus becomes necessary to consider other possible causes for dilatation. The most obvious would be an alteration in the wall of the ureter, of such character as to interfere with normal contraction of its muscle. It would also have to be of such a nature as to account for the fact that in some instances the lower ureteral dilatation spread upward, finally to involve the pelvis of the kidney; in others, it remained unchanged for long intervals, and in still others regressed. Inflammatory disease would meet all these conditions, waxing or waning or remaining unchanged, and, in some instances, finally reaching an irreversible state of fibrosis. But this is precisely the type of lesion to which the ureter, beginning with its lower segment, is most vulnerable by direct contiguity to an infected bladder. As already noted, a continuous pathway of areolar tissue is available throughout its length, in which invading organisms may advance from the bladder to the interstitial tissues of the kidney. This inflammatory involvement of the wall of the ureter, and ultimately of the renal pelvis and calyces, interferes with normal peristaltic activity and results in stasis. When this has occurred, infection may spread through the lumen as well as the wall.

The concept of the ureter as a relatively inactive conduit through which fluid flows mainly by gravity must be discarded. It is, on the contrary, an organ of great dynamic capacity, with two functions. The first is the propulsion of urine from the kidney to the bladder. The second is generally stated to be the prevention of retrograde flow from the bladder back to the kidney. More is involved in this, however, than the prevention of reflux. Simple regurgitation from the bladder into the ureter would be harmless enough were there no stasis or infection. There has been considerable discussion as to whether reflux ever ocurs in the absence of pathological changes. If it does, it is probably transitory and of no great physiological significance. But reflux does become important when it is an evidence of ureteral dysfunction leading to ureteral and pelvic stasis and when, as was always the case in this study, it occurs in the presence of infection of the lower urinary tract. This infection, advancing from the bladder into the wall of the ureter, results, first, in dysfunction of the lower segment.

Without entering into a discussion of ureteral physiology, it is sufficient to state that there is evidence that the activity of the lower segment constitutes, in fact, a dynamic ureterovesical valve. Anatomically, its wall is the thickest of any portion of the ureter, and its outer muscular layer merges indistinguishably with the musculature of the bladder. The lower third of the ureter, moreover, is supplied with parasympathetic ganglions identical to those in the adjacent portions of the bladder wall; the latter were found diminished in number in a case of congenital megaloureter. Thus, there is strong anatomic presumption of an intimate functional relationship between the bladder and the lower ureteral segment.

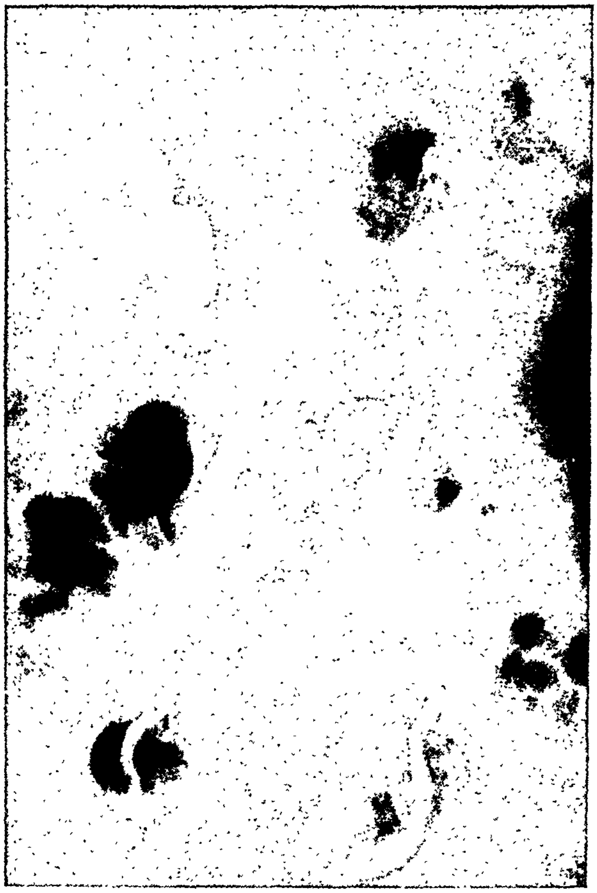


Fig. 7 (case 3).—Hydronephrosis from functional obstruction.

Gould, Hsieh, and Tinckler[17] have suggested that the lower end of the ureter has a task somewhat different from that of the upper and that the integration of tonic and peristaltic activity is such as normally to protect the nephron from the high basic pressures which arise in the lower segment when it is operating to handle large quantities of urine or against elevated intravesical pressures.

Fluoroscopic studies, including recent cinefluorographic investigations, have demonstrated that the lower ureter does, in fact, contract during or immediately after an emptying contraction of the bladder. Again, fluoroscopically, it has been possible to demonstrate that in some patients with vesicoureteral reflux the mechanism remains sufficiently well compensated to operate in approximately normal fashion, and in such instances the kidney may remain undamaged for months or even years (fig. 1). When the process becomes so severe, however, as to be incompatible with normal function, and especially when it advances upward in the ureter and to the renal pelvis, such compensation is impossible and hydronephrosis develops (fig. 2). Even before anatomic hydronephrosis can be demonstrated, however, pressure changes, damaging to renal function and conducive to infection, may already be present. Reverse peristalsis, long since observed in the presence of mechanical obstruction, has more recently been seen to occur also in this functional type.

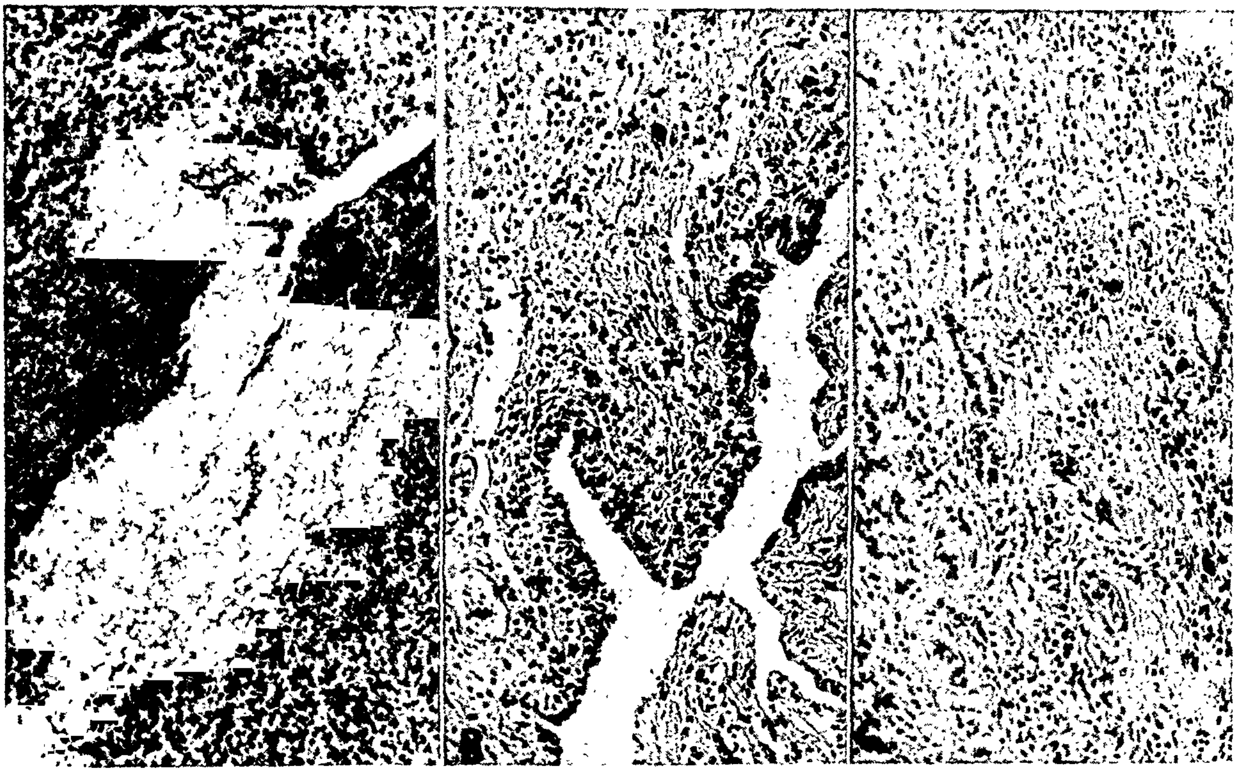


Fig. 8 (case 3).—*A*, acute uretitis in lower ureter; *B*, chronic ureteritis in upper ureter; and *C*, chronic pyelonephritis in kidney.

Thus, by means of serial x-ray studies carried on over a period of months or years, in patients known at the beginning to have infections in the lower urinary tract, and particularly by utilizing those x-ray techniques which make dynamic studies of function possible, changes in the structure and activity of the ureter can be followed and are a strong determinant in favor of the development of pyelonephritis. The same changes can also be interpreted as evidence of infection of the ureteral wall itself. In the continued absence of mechanical obstruction, only an inflammatory process could account for the fact that these abnormalities sometimes advance, sometimes regress, and sometimes remain unchanged for considerable intervals.

Autopsy Findings

In a review of the protocols of a series of autopsies done during a period prior to the institution of this study, 11 cases of ascending pyelonephritis were found. In none of these were there urinary calculi or any other form of mechanical ureteral obstruction. In all 11, the ureter was described as grossly abnormal, usually dilated or thickened, or both. Microscopic studies of the ureter were made in seven cases, in all of which inflammatory changes were seen, confirming the probability that the ureteral wall had served as a pathway of invasion. The next step was to demonstrate this in patients in whom the x-ray findings noted above had been observed.

Case 1 was that of a quadriplegic patient with mild chronic pyelonephritis who died of unrelated causes. The ureters had shown slight transitory dilatation in the lower thirds and reflux had been seen occasionally, although not on every examination. At the time of death there was no clinically active urinary tract infection. Sections of the ureteral wall showed slight infiltration with lymphocytes and plasma cells, with fibrosis and edema in the subepithelial layer. Essentially the same findings were noted in the kidney pelvis. The fact that even a quiescent process of low grade could be demonstrated as coexisting in the ureter and the kidney seemed a suggestive clue to the pathogenesis (fig. 3 and 4).

In case 2, the involvement of one kidney was so severe as to require nephrectomy. The patient was a paraplegic who exhibited unilateral vesicoureteral reflux with apparently complete ureteral decompensation. Sections of the ureter, taken where it was divided at about its midpoint, showed a process strikingly similar to that involving the kidney (fig. 5 and 6).

Urinary tract infection in patients with spinal cord injury has no special characteristics; similar findings have been encountered when the primary disorder in the bladder was other than neurogenic. This is shown in case 3, a man of about 60 who died of uremia resulting from long-standing neglected prostatic obstruction. The kidneys showed chronic pyelonephritis. Acute cystitis was present, and it was postulated, therefore, that the lower ureter should show a fairly severe acute reaction, the upper a chronic and less intense process. This is exactly what was found. Such changes, of course, might well be sufficient to impair peristaltic function, temporarily at least, and to alter significantly the tone of the ureteral wall, leading first to moderate dilatation and later, if the process became irreversible, to functional obstruction and further dilatation, such as marked the end stage in this patient (fig. 7 and 8).

Case 4 was that of a man with carcinoma of the prostate and disseminated metastases. The pathological changes were easily traced from the bladder through several sections of the ureter to the kidney (fig. 9).

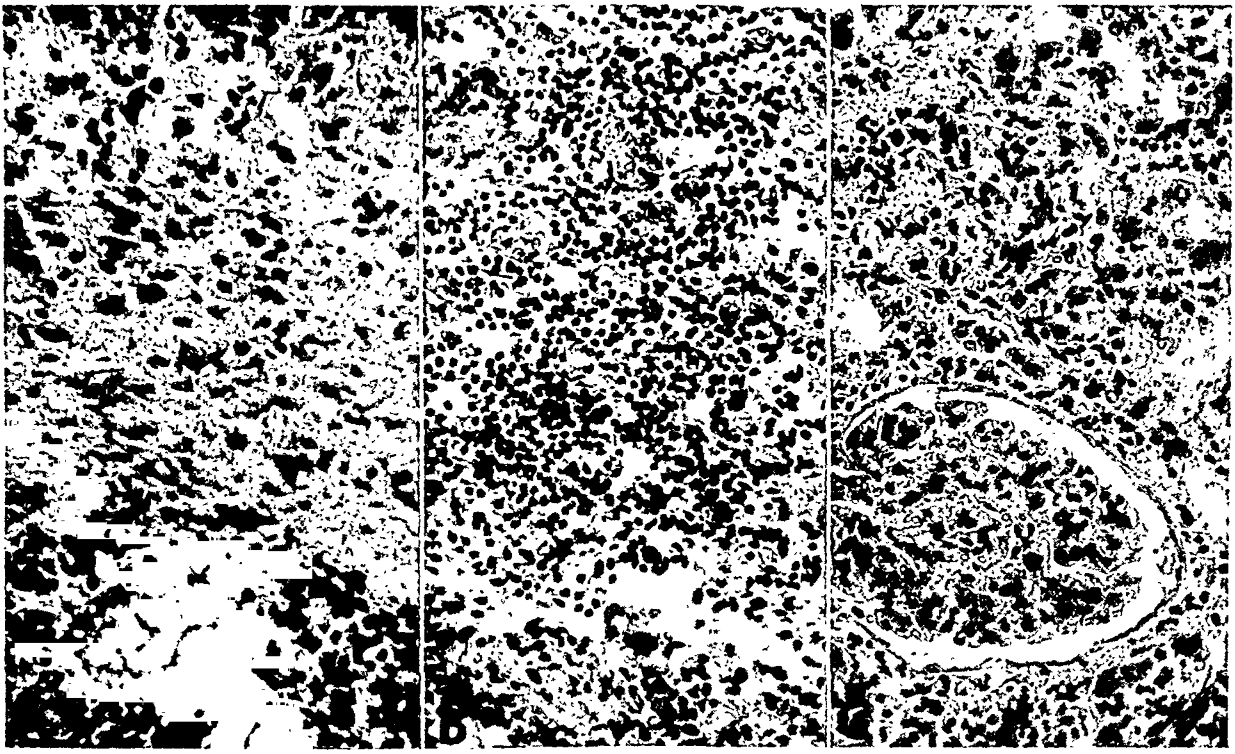


Fig. 9 (case 4).—Pathological changes in carcinoma of prostate: *A*, bladder; *B*, ureter; *C*, kidney.

Since the ureteritis may be mild, or, if severe, may have healed, it is often difficult to establish its presence in specimens obtained at autopsy months or years after the event. This is particularly the case when the function has remained compensated so that there is neither dilatation nor hypertrophy. In such an instance, however, the telltale evidence of fibrosis, demonstrated by differential staining, will suggest past events. Case 5 was that of a man of 62 who died of a massive cerebral hemorrhage. Although cystitis had long been present, the kidney escaped significant damage. The ureter, grossly normal, showed considerable fibrosis in its lower segment and less in its upper, suggesting that it had contained the infection and maintained adequate function (fig. 10).

Prophylaxis and Therapy

This concept of the pathogenesis of ascending pyelonephritis, entailing the appreciation of a dual hazard to the kidney, suggests a dual approach in prophylaxis and therapy. The immediate problem is the elimination of infection, and the bladder, being the primary site, may be considered first. When there is obstruction it must be corrected. Pending this, drainage must be maintained. Whatever hesitancy there may be about undertaking the use of an indwelling catheter in an uninfected bladder, there can be no gainsaying its importance when infection is already present, as it may be even in patients who have not previously been subjected to instrumentation or catheterization. This applies particularly to those who carry residual urine. The danger of ureteral involvement is not eliminated by bladder drainage, but its likelihood is much diminished, especially if the drainage is part of a program aimed at restoring the bladder to normal function. When the obstruction is mechanical, surgical intervention leading to the elimination of residual urine will usually give a satisfactory result.

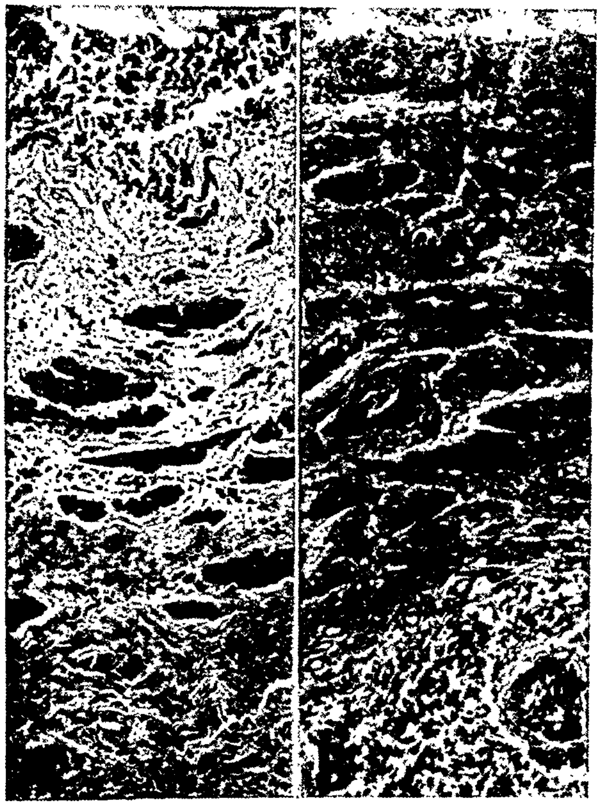


Fig. 10 (case 5).—*A*, lower ureter showing fibrosis; *B*, upper ureter, fibrosis of lesser extent.

Antibiotics or chemotherapeutic agents can be useful adjuvants during the course of treatment, but it is notorious that these alone have been disappointing in the chronic and recurring infections usually associated with obstructive uropathy. When the bladder's inability to empty is due to neurogenic dysfunction, the problem is more complex. Treatment usually involves continuous catheter drainage, sufficiently prolonged to cause almost certain urinary infection. This is a calculated risk, which must be faced. In spite of recent alarms to the contrary, it is a fact that continuous catheterization can be done for long periods of time without apparent damage to the kidneys. Even those who have emphasized the danger of the indwelling catheter recognize that it is sometimes inevitable. Rigid adherence to meticulous techniques and the retraining of the bladder on physiological principles which will shorten the period of artificial drainage further diminish the hazards and make the risk acceptable. If a satisfactory pattern of bladder function can be established and the involvement of the ureter avoided, the major danger to the kidney will have been forestalled.

When pyelonephritis is already present, appropriate constitutional measures and use of antibiotics and chemotherapeutic agents are again indicated for the treatment of the infection, but here the dysfunction of the ureter may call for additional measures to insure adequate drainage of the renal pelvis and protect the parenchyma from the deleterious effects of stasis. Again it must be recalled that the absence of any demonstrable mechanical obstruction means little or nothing. This emerged from empirical knowledge spread over a number of years before the concepts described in this paper had been developed. More frequently in those years than is now happily the case, paraplegic patients with neurogenic vesical dysfunction and urinary infection were prone to develop exacerbations of what was considered to be acute or subacute pyelonephritis, characterized by chills, fever, and leukocytosis. The problem of diagnosis was complicated by the fact that they did not exhibit the customary physical signs and that their urine was infected even when they were well.

The technique of quantitative cultures, since advocated by Kass and Finland[18] and by Beeson,[1] had not been used. X-ray evidence of ureteral dysfunction was often seen, but, on the other hand, it was sometimes found in those who never had these exacerbations. The therapeutic test ultimately clarified the diagnosis. Some patients improved on the administration of large quantities of intravenously administered fluids with various sulfonamide drugs. It became the policy to treat those who did not show improvement after 48 hours by lavage of the kidney pelves, followed by ureteral catheter drainage for 24 to 72 hours. This procedure was almost invariably dramatically successful. Mechanical obstructions were not found, accumulations of more than 15 cc. within the pelvis were rare, and grossly purulent urine was seldom encountered. The inference was that the rapid improvement could be attributed to relieving the kidney of the impediment of stasis.

Comment

When investigations into the pathogenesis of pyelonephritis were first begun, it seemed of primary importance to determine the route by which bacteria reached the kidney. But as studies multiplied and careful observers correlated and interpreted their own and others' work, an interesting new theme appeared and assumed increasingly greater importance. This was a consideration of the situation which might obtain within the kidney and its drainage apparatus to render it more susceptible to infection by whatever route. Previous parenchymal damage and ureteral obstruction, or a combination of both, are the principal determinants. The only other two worthy of mention, apart from the usual general reference to host resistance, are the specificity of certain strains of bacteria and the characteristics of the urine which make it a more favorable culture medium. It might be a matter of no great consequence whether bacteria invading the kidney from the bladder reach it through the blood stream, the lymphatics, or the ureteral lumen or its wall, except that when the last is the case there develops secondarily the important element of obstruction. This derives entirely from local changes, and although it may be attended by altered patterns of neural activity, it is independent of any associated neurological lesion. The significance of these observations, therefore, is not limited to the treatment of patients with spinal cord injury or disease.

Pathogenesis is often considered in terms of a series of morbid anatomic changes, but these rarely develop without associated functional alterations. The development of a disease entity depends no less on pathological physiology than on pathological anatomy. Recognition of this calls for a dynamic rather than a static view of the development of ascending pyelonephritis, a view which is consistent with its ultimate evolution, when the patient faces the hazards of both infection and failing renal function. By the same token, the need for a dynamic approach to prophylaxis and treatment becomes apparent. The progression of pathological changes can often be inferred, and the actual effect of these changes on function followed, by x-ray studies. In favorable cases, measures to relieve obstruction may be instituted. With a normal flow of urine from its pelvis, the kidney is in a favorable position to resist infection, and in particular those infections that arise in the lower tract.

Summary

Pyelonephritis may be hematogenous in origin, but when it follows infection in the bladder, ascent through the ureter is more probable. The subepithelial tissues of the bladder, ureter, and kidney pelvis provide a direct route of invasion which is continuous with the interstitial tissue of the kidney.

The susceptibility of the kidney to infection is markedly enhanced by obstruction. Functional obstruction of the ureter may develop when its wall is involved in inflammatory changes. It is no less a factor than mechanical obstruction would be. The functional changes can be followed, and the underlying process inferred, through serial x-ray studies. The maintenance or reestablishment of adequate drainage of the renal pelvis is a most important factor in the prophylaxis and treatment of ascending pyelonephritis.

References

1. Beeson, P. B.: Factors in Pathogenesis of Pyelonephritis, Yale J. Biol. & Med. **28**:81-104 (Nov.) 1955.

2. Bertrand-Fontaine, T.; Schneider, J.; and Nenna, A.: Etude clinique des néphrites ascendantes, J. urol., Paris **60**:729-752, 1954. Brod, J.: Chronic Pyelonephritis, Lancet **1**:973-981 (June 23) 1956.

3. Jackson, G. G.; Poirier, K. P.; and Grieble, H. G.: Concepts of Pyelonephritis: Experience with Renal Biopsies and Long-term Clinical Observations, Ann. Int. Med. **47**:1165-1183 (Dec.) 1957.

4. Oberling, C.: Les néphrites chroniques ascendantes; anatomie pathologique, J. urol., Paris **60**:776-802, 1954.

5. Mallory, G. K.; Crane, A. R.; and Edwards, J. E.: Pathology of Acute and of Healed Experimental Pyelonephritis, Arch. Path. **30**:330-347 (July) 1940.

6. Jackson, G. G.; Dallenbach, F. D.; and Kipnis, G. P.: Symposium on Clinical Advances in Medicine: Pyelonephritis: Correlation of Clinical and Pathologic Observations in Antibiotic Era, M. Clin. North America **39**:297-305 (Jan.) 1955.

7. De Navasquez, S.: Experimental Pyelonephritis in Rabbit Produced by Staphylococcal Infection, J. Path. & Bact. **62**:429-438 (July) 1950.

8. Asher, L. M., and Sokol, J. K.: Bacterial Localization in Kidneys, Am. J. Path. **17**:273-282 (March) 1941.

9. Lucas, D. R.: Physiological and Pharmacological Studies of Ureter, Am. J. Physiol. **22**:245-278, 1908.

10. De Navasquez, S.: Further Studies in Experimental Pyelonephritis Produced by Various Bacteria, with Special Reference to Renal Scarring as Factor in Pathogenesis, J. Path. & Bact. **71**:27-32 (Jan.) 1956.

11. Beeson, P.B.; Rocha, H.; and Guze, L. B.: Experimental Pyelonephritis: Influence of Localized Injury in Different Parts of Kidney on Susceptibility to Hematogenous Infection. Tr. A. Am. Physicians **70**:120-126, 1957.

12. Braude, A. I.; Shapiro, A. P.; and Siemienski, J.: Hematogenous Pyelonephritis in Rats: Its Pathogenesis When Produced by Simple New Method, J. Clin. Invest. **34**:1489-1497 (Oct.) 1955.

13. Winsbury-White, H. P.: Spread of Infection from Uterine Cervix to Urinary Tract and Ascent of Infection from Lower Urinary Tract to Kidneys, Brit. J. Urol. **5**:249-267 (Sept.) 1933.

14. Weyrauch, H. M., and Bassett, J. B.: Ascending Infection in Artificial Urinary Tract: Experimental Study, Stanford M. Bull. **9**:25-29 (Feb.) 1951.

15. Rényi-Vámos, F.: Lymphogenic Ascending Pyelonephritis, Acta med. Acad. sc. hung. **3**:7-13, 1952.

16. Allen, A. C.: Kidney: Medical and Surgical Diseases, New York, Grune & Stratton, Inc., 1951, p. 342.

17. Gould, D. W.; Hsieh, A. C. L.; and Tinckler, L. F.: Behavior of Intact Ureter in Dogs, Rabbits and Rats, J. Physiol. **129**:436-447 (Sept.) 1955.

18. Kass, E. H., and Finland, M.: Asymptomatic Infections of Urinary Tract, Tr. A. Am. Physicians **69**:56-64, 1956.

DIAGNOSIS AND MANAGEMENT OF THE RARE CAUSES OF GASTROINTESTINAL HEMORRHAGE

James V. Maloney Jr., M.D., Los Angeles

About 10% of all cases of gastrointestinal bleeding involve rare lesions, the treatment of which depends on the exact location of the source of blood. Treatment of existing shock is the only thing that should receive precedence over the taking of a complete history and physical examination. The essence of the treatment of active bleeding is rapid transfusion of enough whole blood to restore normal circulation. The fear that this may make the bleeding worse is unfounded, and the amount of blood needed to restore normal vital signs affords a measure of the rate of blood loss. Nonmanipulative roentgen examination of the gastrointestinal tract need not be deferred for fear of recurrent hemorrhage. If there has been no hematemesis it may be assumed that the bleeding point is below the duodenojejunal junction, and in that case sigmoidoscopic examination and barium enema are essential. Laprotomy with complete examination of the abdomen has failed to reveal the site of bleeding in from 17 to 45% of cases; among the special techniques available in such cases are wide gastrotomy, transillumination, and operative endoscopy. It is possible to examine the ascending, transverse, and descending colon through a single enterotomy in the middle of the transverse colon. If surgery is undertaken, special attention must be given to the anesthesia to prevent aspiration of gastric contents.

The patient with gastrointestinal hemorrhage represents a problem which is a major challenge to the best diagnostic and therapeutic efforts of the internist and surgeon. Of individuals presenting with upper gastrointestinal bleeding, 80% have peptic ulceration of the stomach or duodenum; 5% have intrinsic gastric lesions, such as carcinoma or polyp; and 5% have portal hypertension with bleeding due to varices. Thus, the common causes of upper gastrointestinal bleeding account for 90% of cases. The remaining 10% are due to rare lesions and are the special subject of this discussion.

Preliminary Examination

The localization of the exact site of bleeding is far more important when dealing with the rare causes of gastrointestinal bleeding than it is when the patient gives a typical history of peptic ulceration. Such is the case because chronic peptic ulceration causes gross scarring and contracture which enables the surgeon to identify quickly the pathology when the abdomen is opened. On the other hand, mucosal polyps, congenital telangiectasis, and benign tumors may produce lesions anywhere along 24 ft. of alimentary canal and may completely escape detection by visual inspection and palpation. Surprisingly enough, disagreement still exists as to how extensive a history and physical examination should be done on a patient who is admitted to the hospital with active hemorrhage. Two recently published textbooks recommend that the patient be wrapped in warm blankets and heavily sedated with morphine so that the disturbing elements of history and physical examination will not prevent the spontaneous cessation of hemorrhage. With this attitude I cannot agree. Statistically, such a patient has between a 3 and 20% chance of becoming exsanguinated. There are few surgical emergencies in which there is a more urgent need for a complete history and meticulous physical examination, both performed as soon as possible. The treatment of shock, if it is present, is the only consideration taking precedence over this preliminary examination.

The history not only must include that of the gastrointestinal system but should be extended to include a detailed history, system review, and social and family history. A history of nosebleeds or the use of medicaments known to be associated with bone marrow depression may be the clues necessary to establish a blood dyscrasia as the cause of the hemorrhage. As the clinical experience and confidence of a physician increases, he is likely to forget the dictum taught to medical students: "Seventy per cent of useful diagnostic information comes from the history, 20% from the physical examination, and only 10% from special laboratory tests."

Similarly, the minute details of the physical examination are important. A small supraclavicular node or rectal shelf may identify the source of bleeding as gastric carcinoma. A cutaneous spider somewhere

---

From the Department of Surgery, School of Medicine, University of California at Los Angeles. Dr. Maloney is a John and Mary R. Markle Scholar in Medical Science.

Read before the Section on Surgery, General and Abdominal, at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958. Read in part at the Postgraduate Course on Pre- and Postoperative Care, Clinical Congress of the American College of Surgeons, San Francisco, California, Oct. 9, 1956.

on the body may be the only hint of liver disease with bleeding due to esophageal varices. In my series of cases, an 8-year-old boy passed large quantities of blood per rectum and was admitted to the hospital in profound shock. During the course of the physical examination, several purpuric spots were noted in the gluteal region, an area of the body frequently neglected in the examination of a patient sitting or lying in bed. In this case, barium enema, gastrointestinal series, endoscopy, and other diagnostic tests would have been as fruitless as an operative inspection and palpation of the patient's gastrointestinal tract. Observation of the purpuric spots led to a diagnosis by blood smear of idiopathic thrombocytopenic purpura, and the patient was cured by an emergency splenectomy.

When all gastrointestinal bleeders are considered as a group, the minutiae of a detailed history and physical examination may be rewarding in only a relatively small percentage of cases. However, in that 10% of patients having one of the rare causes of gastrointestinal bleeding, a significant portion of them will be spared the delay and inconvenience of extensive diagnostic tests.

Immediate Treatment

In the treatment of the actively bleeding patient, the most important determinant of the patient's future therapy is the rate of bleeding. In my experience the patient's estimate of the amount of blood vomited or passed per rectum is unreliable. Moreover, the volume of blood vomited or passed per rectum may be a poor reflection of the total volume lost from the circulation but retained within the intestinal lumen. A somewhat more objective evaluation of blood loss can be obtained by a consideration of the known association of clinical signs with percentage reduction in blood volume. The loss of 20% of the circulating blood volume may be expected to produce tachycardia, narrowed pulse pressure, mild hypotension, and the peripheral signs of hypovolemic shock, provided this loss occurs in too brief a time (one to three hours) to be compensated for by hemodilution. (Blood volume=about 7.5% of body weight. Therefore, a 70-kg. [154-lb.] patient showing these clinical signs will have bled 20%×7.5%×70 kg.=1.05 kg., or 1,050 ml.). Larger acute blood losses will produce a greater tachycardia and a more profund fall in arterial blood pressure.

The essence of the treatment of the actively bleeding patient consists in the rapid (preferably within one hour) transfusion of a sufficient quantity of whole blood to restore the clinical circulatory signs to normal. In general, pulse and blood pressure will return to normal at a point when blood volume is approximately 10% below normal. For this reason, a man weighing 70 kg. is given approximately 500 ml. (10%×7.5%×70 kg.=525 ml.) more blood than is necessary to restore the vital signs to normal. Provided this restoration of blood volume is accomplished within one hour, the physician is in an excellent position to estimate the rate of bleeding in milliliters per hour during the next two or three hours. The rate of blood loss into the gastrointestinal tract will be equal to that amount of blood necessary to maintain normal vital signs during the subsequent hours.

Repeated determinations of hemoglobin level and hematocrit value are of little practical value in the presence of massive bleeding, since the process of hemodilution requires many hours and depends on the state of body hydration and other factors. These tests are more helpful in the patient with slow bleeding (less than 100 ml. per hour). Hematocrit determinations are of distinct help in the evaluation of patients with chronic bleeding, since the clinical problem here is the treatment of anemia rather than hypovolemia. The measurement of blood volume by the Evans blue dye technique is a simple procedure, but there are serious objections to its accuracy in the presence of shock, vasoconstriction, and a changing blood volume. The most cogent objection to the use of the dye technique is the fact that the so-called normal values for an individual of a given weight or surface area are based on an average figure obtained from a large population. Even when provided with a measurement of the blood volume in a bleeding patient, the physician has no way of knowing the normal volume for that individual. For these reasons, the readily assessed clinical circulatory signs are the best guide to blood replacement.

The fear that rapid transfusion may reinitiate bleeding which has stopped is unfounded. The slow restoration of blood volume over a period of four or five hours in a massively bleeding patient is undesirable, since the continuing loss of blood into the gastrointestinal tract and the varying clinical signs make it impossible to estimate the rate at which the patient is bleeding. Moreover, prolonged hypovolemia has adverse physiological effects. If the rate of blood administration necessary to maintain normal vital signs is 500 ml. per hour, the physician is dealing with massive hemorrhage. It can be estimated that the patient will have required 3,500 ml. of blood over the ensuing seven hours. Such a volume and rate of bleeding would certainly be an indication for surgery, even if the site of bleeding were not localized. This estimation, therefore, sets the time limits within which the definitive diagnostic tests must be completed.

Special Tests

In addition to the routine urine and blood tests associated with the history and physical examination, a blood smear and bleeding and coagulation studies are done. There are, in addition, a number of special tests which are of assistance in differentiating the common from the rare causes of intestinal hemorrhage.

For many years, barium examination of the upper gastrointestinal tract was deferred for three weeks after active bleeding for fear of recurrent hemorrhage. There are now several large series of cases which demonstrate that the activity of bleeding is in no way affected by the barium meal, provided that manipulation of the abdomen is minimal and judicious. In those patients with hematemesis and not suspected of having esophageal varices, a large Ewald tube (no. 30 F) is passed to remove clotted and liquid blood from the stomach in preparation for the barium meal. The usual nasogastric tube cannot be expected to prevent accumulation of blood in the stomach unless preliminary removal of clotted blood and food residue is accomplished with a large tube. The use of a Sengstaken tube in the diagnosis and treatment of esophageal bleeding is beyond the scope of this discussion.

The sulfobromophthalein test of liver function has been of particular value in eliminating esophageal varices from the differential diagnosis.[1] On the other hand, demonstration of a severe degree of liver impairment by this test does not indicate that the patient is necessarily bleeding from varices. The increased incidence of peptic ulcer in cirrhotic patients is well recognized, and bleeding from alcoholic gastritis and hiatus hernia is not uncommon in association with cirrhosis. Esophagoscopy is considerably more accurate in the demonstration of varices than is the barium swallow done in association with the upper gastrointestinal series. In my experience gastroscopy has been of little value in the massive bleeder, although it is frequently helpful in patients bleeding slowly from rare lesions such as gastric polyp, esophagogastric ulcer, or multiple gastric erosions. In patients who have not had hematemesis to indicate that the bleeding is from above the muscle of Treitz, sigmoidoscopic examination and barium enema are essential.

A long gastrointestinal intubation tube may be helpful in localizing the site of a bleeding benign tumor, provided that acute massive hemorrhage is not a problem. As the tube passes down the intestinal tract under fluoroscopic guidance, repeated samples of intestinal contents are made and examined chemically for the presence of blood.

Operative Management

The operative management of the gastrointestinal bleeder is relatively easy provided that the diagnostic studies have revealed the source of bleeding, or, at the very least, the general area of the intestinal tract in which it is located. It is a general principle that the surgeon should not operate unless the site of bleeding has been identified. An exception to this occurs when it is impossible to locate the site and continuing hemorrhage threatens the patient with death by exsanguination. Unfortunately, this exception is a frequent one.

In a significant portion of patients operated on without a diagnosis, the source of bleeding will immediately be apparent on entering the abdomen. Evidence of peptic ulceration, previously undemonstrated by x-ray, is often apparent in the duodenal region. Excessive venous collateral circulation, gross liver disease, and the elevation of portal venous pressure as measured by a saline manometer may suggest bleeding from esophageal or gastric varices. Even with the whole intestinal tract available for palpation and inspection at the time of operation, the surgeon has a very poor record in finding the source of previously unidentified bleeding. Gilchrist and Chun[2] failed to find the site in 45% of their patients, Stewart and associates[3] in 17%, and Cooper and Ferguson[4] in 33%. When complete examination of the abdomen fails to reveal the source of hemorrhage, there are several maneuvers which are of particular value.

Wide Gastrotomy.—With Spencer[5] I recently reviewed my experience with the use of gastrotomy. In 11 patients in whom the procedure was carried out, the site of bleeding was demonstrated in 10. Although gastrotomy has been criticized,[6] it is my firm conviction that failure to find it useful is due to technical aspects of the manner in which it is performed.[5] A generous 7-in. incision is made on the anterior surface of the stomach in such a manner that no blood from the cut surface of the gastric wall contaminates the lumen of the organ. Deaver retractors and the operator's hands are placed within the lumen of the stomach and an inch-by-inch inspection made of the mucosal surface. Particular care is taken to visualize the junction of the esophageal and gastric mucosa, a common site of ulceration associated with reflux of gastric contents. Gastrotomy is supplemented with duodenotomy when indicated.

Transillumination.—The jejunum and ileum lend themselves particularly well to inspection by transillumination. Although a Cameron light may be helpful, no special equipment is needed. A portable spotlight in a darkened operating room is all that is required. The spotlight is lowered to table height and the intestine is held in the path of its light beam. A folded towel held adjacent to the intestine by an assistant shields the operator's eyes. Figure 1 illustrates the ease with which the interior of the small intestine may be inspected by transillumination. The technique is so satisfactory that intraluminal objects as small as grape seeds are easily visualized.

Operative Endoscopy.—With the use of a 25-cm. lighted sigmoidoscope, it is possible to inspect the mucosa of the entire small intestine from the pylorus to the ileocecal valve. This method is particularly applicable to the distal duodenum which, because of its retroperitoneal location, is unavailable to inspection by other means. After mobilization of the duodenum by the Kocher maneuver, a single enterotomy is made in the third portion of the duodenum, thus permitting inspection of the ampulla of Vater and the retroperitoneal portion of the organ. By telescoping the small intestine on a sigmoidoscope it is possible to examine its full length with use of only three enterotomies. However, operative endoscopy is usually unnecessary in the jejunum and ileum, since in this area transillumination is so satisfactory.

Operative coloscopy is of unique value in the detection of obscure bleeding in the colon. Preoperative barium studies, even by the air contrast technique, will reveal only half of the polyps present, and inspection and palpation are almost as inaccurate.[6b] In patients suspected of bleeding from the lower tract, preoperative preparation of the intestine with neomycin and phthalsulfathiazole (Sulfathaladine) is used. In emergency situations, mechanical cleansing of the intestine combined with a neomycin retention enema will sterilize the colon. The method of coloscopy is illustrated in figure 2. By dividing the peritoneal attachments of the hepatic and splenic flexures of the colon, it has been found possible to examine the entire colon through a single enterotomy made in the midtransverse colon. The rectum and sigmoid are, of course, examined per rectum preoperatively. Alternative techniques of coloscopy have recently been described by Deddish and Hertz[7] and by Shackelford and McGeehan.[8]

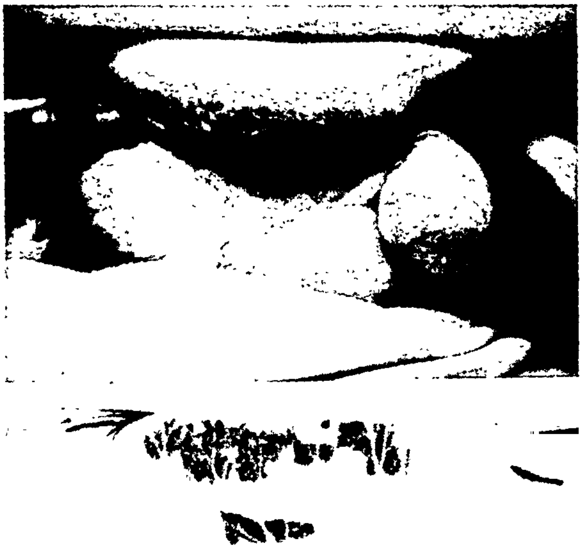


Fig. 1.—Loop of jejunum elevated and back-lighted with spotlight. Folded towel shields operator's eyes. *Top*, before accessory operating room lights are turned off. *Bottom*, after room is darkened.

Blind Gastrectomy.—Several authors have reported that the performance of a so-called blind gastrectomy in the absence of demonstrable pathology will prevent recurrent hemorrhage in a significant number of patients.[9] Success of this procedure depends on the removal of bleeding lesions in the distal portion of the stomach which cannot be detected by palpation or on the reduction of gastric acidity. However, in view of the frequency with which bleeding lesions occur in the upper third of the stomach, it would not appear that blind gastrectomy is always a logical approach to the problem. Many authors have reported patients who have become exsanguinated from a lesion remaining in the proximal stomach after blind gastrectomy.

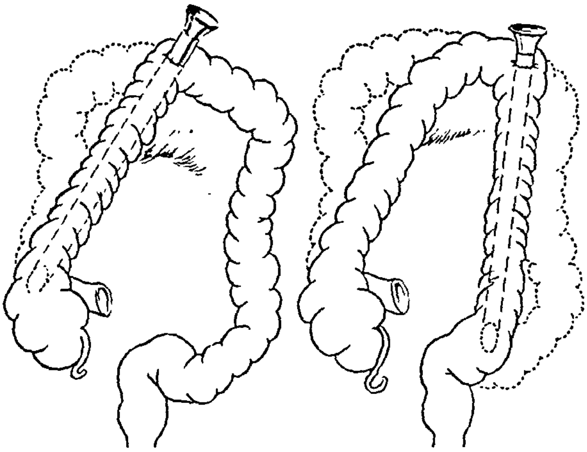


Fig. 2.—Technique of operative coloscopy. After division of peritoneal attachments of hepatic and splenic flexures, entire colon can be examined through single enterotomy in transverse colon.

Gastrotomy.—My experience with gastrotomy was recently reviewed with Spencer.[5] All patients who had been operated on for gastrointestinal bleeding during the preceding 12 months were reviewed. In by far the large majority of cases the bleeding lesion was demonstrated prior to operation. However, there remained 18 patients whose lesions defied our best diagnostic efforts. In seven of these patients the bleeding area was easily located by palpation or inspection when the abdomen was opened. The site of bleeding in the remaining 11 patients was undetermined. These 11 patients satisfied what many would consider the criteria for blind gastrectomy. Instead of performing such a resection, a wide gastrotomy was performed by the technique previously described. The location of the lesions, in three groups, is indicated in figure 3. Blind gastrectomy would have cured with certainty only the three patients in group 1, in whom the bleeding lesion was located in the distal portion of the stomach. There were four patients in group 2 who may, or may not, have been cured, depending on the exact location of the resection. In the four patients in group 3, the bleeding lesion was far up in the gastric remnant or esophagus, and it would presumably have continued to bleed after a blind resection. In addition, the routine use of blind gastrectomy in these cases would have unnecessarily removed the stomach in one patient who had an esophagastric ulcer associated with diaphragmatic hernia and in another patient who had bleeding due to esophageal varices. On the basis of these cases, we believe that a large gastrotomy with definite location of the bleeding point is a more rational procedure than blind gastrectomy.

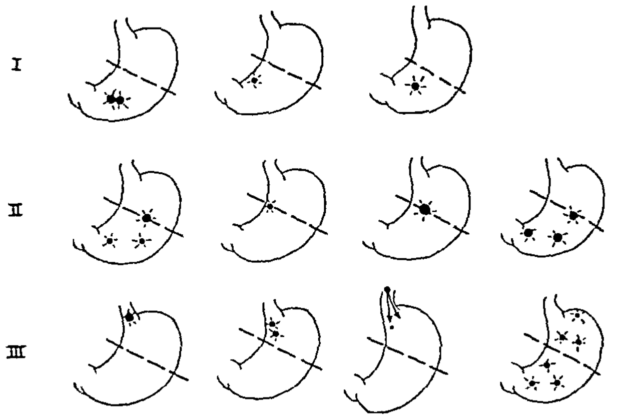


Fig. 3.—Schematic presentation of location of bleeding lesions in 11 patients subjected to large gastrotomy. Blind gastrectomy would have cured with certainty only those patients in group 1.

Despite these criticisms of blind gastrectomy, there are undoubtedly instances where it is valuable. The wisdom of the statement by Osborne and Dunphy[10] on this subject is apparent:

> Although we realize that "blind" gastrectomy may be required because the lesion cannot be identified at operation, we feel that overemphasis of this approach leads to failure to identify lesions which will not be removed by gastrectomy or the performance of this operation for lesions which might not have required it. This is particularly true of the surgeon who has not had extensive experience with the obscure bleeding lesion and who, under the stress of an emergency operation, may overlook a demonstrable site of bleeding because he does not use a systematic examination during laparotomy and fails to appreciate the nature and variety of pathological lesions concerned.

Anesthesia.—A comment regarding anesthetic technique in these cases is pertinent. The presence of blood in the stomach presents a special problem for the anesthesiologist. A distended stomach is a contraindication to the induction of general anesthesia, and active bleeding makes gastric aspiration unreliable. Rapid induction and tracheal intubation with barbiturates and muscle relaxants has had an unfortunate popularity in this situation. The sudden relaxation of the diaphragmatic hiatus with this technique may produce massive regurgitation and aspiration of blood and barium before the endotracheal tube can be placed. An acceptable technique consists in the placement of the endotracheal tube with the patient under topical anesthesia and awake. General anesthesia is begun only after the cuff of the endotracheal tube is inflated. The possibility of aspiration is thus avoided.

Report of Cases

An enumeration of all of the rare causes of gastrointestinal bleeding is beyond the scope of this discussion and, in fact, would be quite impossible. Regardless of the exact nature of the bleeding lesion, the general diagnostic and therapeutic regimen outlined above may be expected to give satisfactory results in the majority of patients. Two cases are presented in brief to illustrate the value of the diagnostic and surgical approach outlined above.

Case 1.—A 54-year-old woman, suffering from gastrointestinal hemorrhage, was noted to have a number of fibromas of the skin as well as a *café au lait* spot in her lumbar region. By the passage of a long intestinal tube under fluoroscopic guidance with repeated aspiration of the intestinal contents, the site of hemorrhage was demonstrated to be just below the muscle of Treitz. A preoperative diagnosis of von Recklinghausen's *neurofibromatosis intestinalis* was made. Operation confirmed the presence of bleeding neurofibromas 1 ft. below the ligament of Treitz (fig. 4, *top*).

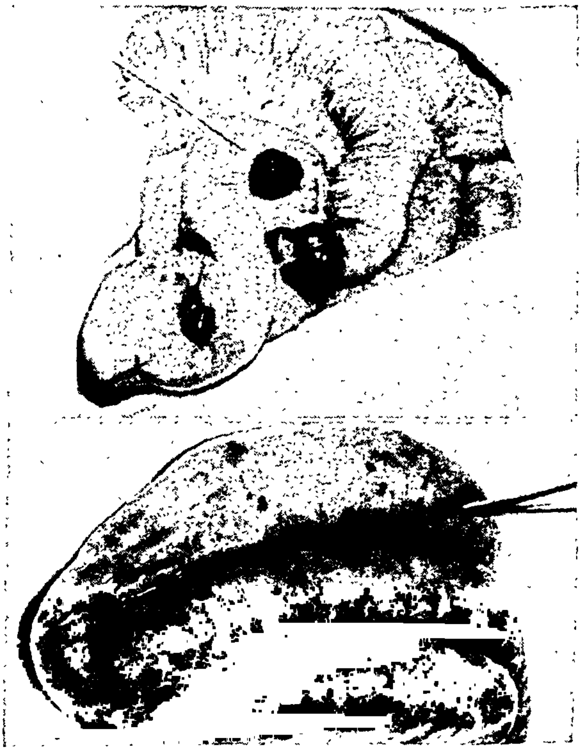


Fig. 4.—Illustrations of rare lesions diagnosed preoperatively. *Top,* intestinal neurofibromatosis (Recklinghausen's disease). *Bottom,* intestinal telangiectasia.

Case 2.—A 14-year-old girl was seen for chronic gastrointestinal bleeding with secondary anemia. The patient's history revealed that she had not yet undergone the menarche, and physical examination demonstrated delayed development of secondary sex characteristics. A preoperative diagnosis of congenital intestinal telangiectasia was made, a condition which has been reported in association with ovarian agenesis. This diagnosis was confirmed at operation where a dilated blood vessel was seen leading to each one of the telangiectatic lesions (fig. 4, *bottom*).

These cases illustrate well the principle that a carefully taken history, a meticulous physical examination, and the judicious use of special tests permit an accurate preoperative diagnosis even in the presence of extremely rare diseases.

Summary

The rare causes of gastrointestinal bleeding account for 10% of all cases of hematemesis and melena and, therefore, represent a surgical problem worthy of careful attention. It is recommended that the physician pursue an aggressive diagnostic program which begins with complete history and meticulous physical examination and includes all routine laboratory work. A judiciously performed x-ray study with barium meal should be done early in the patient's course. It can be expected to give much information and will not adversely affect the bleeding process. The sulfobromophthalein excretion test, esophagoscopy, gastrointestinal aspiration, and other special diagnostic procedures may be indicated by the circumstances in individual cases. Regarding operative management, the most important dictum is that which states that the surgery must be deferred until the source of bleeding is located. It is universal experience that the surgeon is poorly equipped to locate the source of bleeding at the time of operation. However, operation must frequently be performed in those patients who fail to respond to transfusion and in whom exsanguination threatens. Under these circumstances, palpation, inspection, gastrotomy, transillumination, and operative endoscopy are valuable technical aids. Blind gastrectomy may miss a significant number of bleeding lesions in the gastric remnant. A large gastrotomy permits direct examination of the interior of the stomach, the lower end of the esophagus, and the duodenum and offers a more rational operative approach than blind gastrectomy.

Even the physician who approaches the problem of obscure gastrointestinal bleeding with consummate care, wisdom, and skill will encounter some patients who defy diagnosis and die of hemorrhage. It is perhaps some consolation to him in such cases that even the pathologist is occasionally unable to find the source of bleeding at autopsy.

References

1. Zamcheck, N.; Chalmers, T. C.; White, F. W.; and Davidson, C. S.: Bromsulphalein Test in Early Diagnosis of Liver Disease in Gross Upper Gastrointestinal Hemorrhage, Gastroenterology **14:**343-363 (March) 1950.

2. Gilchrist, R. K., and Chun, N.: Severe Hemorrhage in Presumed Peptic Ulcer: Surgical Treatment in Absence of Demonstrable Lesion, A. M. A. Arch. Surg. **69:**366-377 (Sept.) 1954.

3. Stewart, J. D.; Massover, A. J.; Potter, W. H.; and Schaer, S. M.: Massive Hemorrhage from Gastroduodenal Ulcer, Surgery **24:**239-245 (Aug.) 1948.

4. Cooper, D. R., and Ferguson, L. K.: Gastric Resection for Upper Gastrointestinal Hemorrhage of Undetermined Cause, J. A. M. A. **151:**879-884 (March 14) 1953.

5. Spencer, F. C., and Maloney, J. V., Jr.: Examination of Gastric Mucosa Through Large Gastrotomy in Diagnosis of Intestinal Hemorrhage of Obscure Origin, Surgery **40:**904-912 (Nov.) 1956.

6. (*a*) Parsons, K. O., and Aldridge, L. W.: Partial Gastrectomy in Treatment of Bleeding Peptic Ulcer: Report on 50 Consecutive Operations, Brit. J. Surg. **38:**370-378 (Jan.) 1951. (*b*) Thieme, E. T.: Empiric Use of Gastric Resection in Treatment of Upper Gastrointestinal Hemorrhage, Surgery **35:**56-61 (Jan.) 1954.

7. Deddish, M. R., and Hertz, R. E.; Coloscopy in Treatment of Mucosal Polyps of Colon, S. Clin. North America **37:**1287-1295 (Oct.) 1957.

8. Shackelford, R. T., and McGeehan, J. S.: Improved Technique of Coloscopy, J. A. M. A. **167:**280-284 (May 17) 1958.

9. Wangensteen, O. H.: Ulcer Problem: I, Etiology, with Special Reference to Inter-relationship Between Vascular and Acid-Peptic Digestive Factors: II, Characterization of a Satisfactory Operation Which Will Protect Against Recurrent Ulcer, Canad. M. A. J. **53:**309-331 (Oct.) 1945.

10. Osborne, M. P., and Dunphy, J. E.: Identification of Cause of Obscure Massive Upper Gastrointestinal Hemorrhage During Operation, A. M. A. Arch. Surg. **75:**964-971 (Dec.) 1957.

CONTROL OF GASTROINTESTINAL HEMORRHAGE.—Patients with massive acute gastrointestinal hemorrhage can be effectively managed with an initial trial of vigorous transfusion therapy, providing its limitations are strictly observed. These are (1) failure of response to 5 pt. of blood within any 24-hour period; (2) failure of response to any amount within 48 hours, or (3) rebleeding under treatment. Any one of these indicates need for prompt surgical intervention. A relatively fixed mortality rate has been observed over the years for massive acute upper gastrointestinal hemorrhage, despite the increasing availability and use of whole blood. New measures for these patients are needed if mortality is to be lowered. Some help may come from earlier decision about operation, guided in each patient by his response to transfusion therapy.—D. W. Elliott, M.D.; Richard Hartle, B.S.; Foster Marshall, M.D.; and R. M. Zollinger, M.D., Response to Transfusion as Guide in Management of Upper Gastrointestinal Hemorrhage, *A. M. A. Archives of Surgery,* September, 1958.

REHABILITATION OF THE PATIENT WITH LONG-TERM RESPIRATORY PARALYSIS

Harold N. Neu, M.D., Omaha

Long-term respiratory paralysis creates problems of rehabilitation. Experiences of a respiratory and rehabilitation center of 30 beds are here analyzed. Twenty beds were reserved for patients with chronic respiratory paralysis. In a five-year period there have been 375 admissions, including readmissions for rechecks, and the 100 patients with the most marked involvement of respiratory and other neuromuscular mechanisms were selected for special study. Such patients require continued care equivalent to that given to the acutely ill patient, and 64 of them arrived in tank respirators. The average period of rehabilitation was 8 months, but some required more than 12. The most frequent complications were renal calculi (detected in 38 patients) and atelectasis (in 36). The best results were obtained when the process of weaning from the respirator was concomitant with rehabilitation instead of taking precedence over it. Although 98% of the patients were freed from the tank respirator, only 16% were freed from all respiratory aid. Five patients died at the center, but 80 were able to return to private home care, and 44 were cared for completely by the family. Sixteen patients who were housewives continued as the dominant figures in their home situation despite continued dependence on respiratory aids. A program of comprehensive care and rehabilitation for this type of patient is economically desirable and has incalculable human values.

Medical science is continually impaled on the horns of dilemmas of its own creation. The development of the tank respirator has occasioned the saving of the lives of thousands of patients who otherwise would have died. At the same time, its use has left in society a large group of respiratory cripples whose pulmonary reserve has been depleted to such an extent that continued respiratory aid of some sort is needed if a reasonably useful life is to be permitted them. There are many others whose pulmonary reserve is adequate to meet the activities of daily living, provided that respiratory infection does not supervene. With the incidence of paralytic poliomyelitis reduced by the poliomyelitis vaccination programs, there is danger that this group of patients will be forgotten by the average physician who attends them, unaware of the further rehabilitation needs of these patients for whom the Salk poliomyelitis vaccine came too late.

In a recent survey, Landauer and Stickle[1] estimated that between 1952 and 1956 there were approximately 9,600 patients with poliomyelitis who had a history of use of respiratory aids during some period of their illness. This is estimated to be 15% of persons with paralytic disease in this period. In their analysis of the poliomyelitis cases reported between 1952 and 1956, they also concluded that 17.4% of the patients were found to have severe paralysis of all eight body areas reported, namely, both arms and both legs, intercostal muscles, diaphragm, trunk extensors, and abdominal muscles. The patient with respiratory crippling is usually further handicapped by loss of muscular power to perform simple activities of daily living.

Respiratory and Rehabilitation Centers

Since 1950, the National Foundation for Infantile Paralysis[2] has aided the establishment of 17 respiratory and rehabilitation centers by assuming the sponsorship and financial help needed for their operation. These centers are located in teaching hospitals that are affiliated with medical schools. They vary in size from units of 15 to 160 beds. Leadership varies from center to center only in that it stems from different disciplines, such as pediatrics, internal medicine, neurology, orthopedics, and physical medicine. The primary purpose of the centers was to stimulate the development and demonstration of techniques and procedures which would enable patients afflicted with severe respiratory difficulties and associated paralysis resulting from poliomyelitis to return as rapidly as possible to normal life. In the past, the life-threatening character of respiratory paralysis dominated the thinking of the physician who treated the disease. He gave little thought to the dilemma which he had created, namely, that of a quadriplegic patient who continued to require respiratory aid. Experience by various centers has demonstrated that maximum rehabilitation is obtained when the first clinician who has seen the patient is aware of the problems that long-term respiratory paralysis can create.

Some of the centers have been located in large metropolitan areas, so that ready referral of patients from acute services could be obtained. In some of these instances, members of a center's team were

---

Professor of Medicine, Creighton University School of Medicine, and Medical Director, Respiratory and Rehabilitation Center, Creighton Memorial St. Joseph's Hospital.

Read before the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

able to participate in the direction of acute service, a most desirable arrangement. Other centers are located in such a manner that referrals to them come from many states and usually quite a few months after the acute onset. Since there is every reason to believe that there will continue to be isolated patients, particularly young adults, who will contract paralytic poliomyelitis with respiratory complications, I have undertaken to present some of the experiences of one of the centers which is in this latter category. It is hoped that this will stimulate early referral to the centers for such patients and that it will demonstrate the economic value of the comprehensive rehabilitation program for even the patient with severe respiratory involvement and quadriplegia.

The Respiratory and Rehabilitation Center which was established at Creighton Memorial St. Joseph's Hospital, Omaha, in 1953 has 30 beds under its jurisdiction, with 20 of these beds reserved for patients with chronic respiratory paralysis. The usual medical and nursing facilities of a department of rehabilitation, including such co-professional personnel as physical therapists, occupational therapists, medical social workers, vocational psychologists and counselors, orthotists, and speech and hearing therapists, are available for the care of these patients. The direction of the program is under the department of medicine. Consultant services in the fields of neurology, pediatrics, physical medicine, orthopedics, otolaryngology, urology, and psychiatry are utilized in a regular service rotation. A pulmonary function laboratory with a respiratory physiologist in charge is available for the medical evaluation of the respirator patients.

In the approach to the patient, attempts are made to take into account the patient as a whole human being, with physical, mental, emotional, spiritual, social, and vocational problems all interrelated. A team approach, which is physician-directed but patient-centered, is concerned about integrating these various aspects of the patient's problems for his maximum benefit. Multiprofessional staff conferences are indispensable in attaining reasonable goals for the patient. As a result, physician, nurse, physical therapist, occupational therapist, medical social worker, psychologist, orthotist or engineer, vocational counselor, and educational coordinator meet regularly to reach agreement on total patient care objectives and thereby maintain consistent attitudes toward the patient and his family. The Respiratory and Rehabilitation Center has been particularly fortunate in having all of the various disciplines located contiguously. Thus, daily association with each other helps to break down the professional barriers which frequently exist between different professional groups. It also lends to rapid and free communication which is so essential in comprehensive care planning. Benton and Kriete[3] have pointed out that the scope of management of the respirato [illegible]'s knowledge of the field of [illegible]

Source of Material for Study

Since the center opened five years ago, there have been 375 admissions. This includes, however, a number of readmissions of patients for short periods of evaluation some months or years after their initial admission. In order to provide data that were meaningful, 100 patients whose respiratory involvement, and involvement in other body areas, was the most marked were selected for this study. Only the patient's first admission was considered, since it was our policy to keep the patient initially until a satisfactory program for his disposition could be developed or until the staff felt that maximum rehabilitation had been obtained.

In this study, 100 patients are presented for reasons of statistical simplicity. They represent, however, the selection of the most difficult rehabilitation problems we have encountered in our experience. As has been mentioned in previous reports,[4] the patients were brought to the center by air evacuation, ambulance, or train. They tolerated the air evacuation satisfactorily. This method has been most useful in that it greatly shortens the time of transit. Most of the patients came from the states of Nebraska, Iowa, Kansas, Minnesota, and South Dakota, although at least 32 of the group came from 12 other Midwestern and Rocky Mountain states. This factor may have influenced the age distribution of our patients, in that parents of younger children may be more reluctant to send them great distances for medical care.

There were 52 males and 48 females in the group. Seventy-four were between 10 and 30 years of age. This adds significance in the rehabilitation process. On the one hand, it is a period of life where physical appearance is a matter of considerable concern and deformity can be threatening. On the other hand, most of the patients were alert and enthusiastic, and their minds had not been greatly damaged by organic changes.

The source of admission for this group of patients was primarily other hospitals, 88 belonging in this category. Twelve patients were admitted from a private home or a nursing home. The hospitals as sources of admission varied from small 24-bed units in isolated rural communities where the patient had been the only one with poliomyelitis to larger metropolitan institutions in which an acute poliomyelitis service had been maintained. In many of the smaller institutions, private duty nurses were required around the clock for the patient even many months after onset, thereby raising the per diem cost for such patients to levels as high as $50 or $60.

Spencer[5] has clearly shown that the ideal program is effected when the staff can establish confidence in the patient and his family during the acute stage, again when it can wean the patient from respiratory assistance in the immediate post-acute stage, and, from this point, when it can proceed into an active rehabilitation program for convalescent respirator patients. In our group of patients, this optimum condition could not be obtained. Figure 1 indicates the distribution of the patients according to the time of onset prior to admission to the center. Sixty-six of the patients had had their acute onset more than eight months prior to admission.

Assuming a modest per diem cost of $20 prior to admission to the center, $1,356,000 had already been spent for the care of these patients. It would be reasonable to assume that this cost would continue for most of them indefinitely unless some attempt at rehabilitation was made. These figures also show that the long-term cost to the respirator patient cannot be thought of in terms of simple custodial care because of the complexity of the mechanical equipment that is required to keep the patient living from day to day. Continued care of the respirator patient without a vigorous program of rehabilitation usually amounts to the same as acute care.

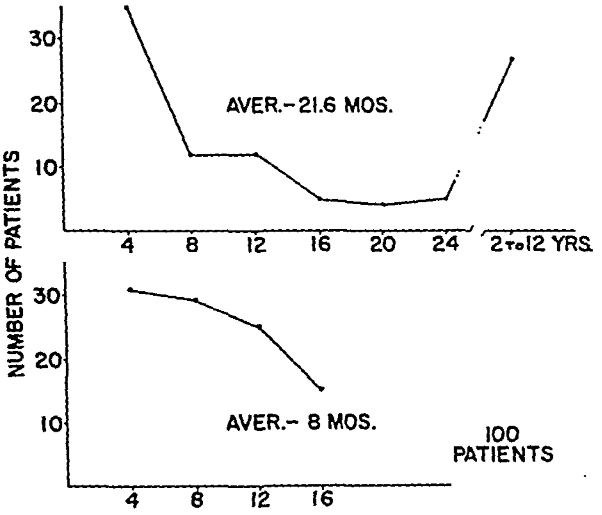


Fig. 1.—*Top,* time of onset of poliomyelitis, in months, prior to admission to Respiratory and Rehabilitation Center. *Bottom,* period of time in center.

Status of Patients on Admission

Respiratory Status.—Of the 100 patients, 64 were brought to the center in a tank respirator, 31 were using a chest respirator, and only 5 had been using a rocking bed at home. The type of respiratory aid used usually correlated with the severity of the patient's physical impairment; however, there were exceptions to this. In a few patients who, on admission, used lesser aids, there was immediate recognition that greater respiratory aid would be required to maintain adequate oxygen saturation and pCO_2 levels. In a few others, the need for hyperventilation was such that although the patient was admitted in a tank respirator he could be very soon weaned to a lesser respiratory aid.

The *vital capacity* is routinely measured in all patients and compared to predicted normals, with use of standards previously described in the literature. In this study, the vital capacities varied from less than 100 cc. up to 1,000 cc. In each of the patients the vital capacity was less than 30% of the predicted normal. Seventy-nine patients were admitted with vital capacities less than 15% of normal.

Affeldt and co-workers,[6] in a study concerning the prognosis for respiratory recovery in severe poliomyelitis, showed that of 500 respirator patients 364 became free of all respiratory equipment within two years of onset. They noted, however, that 83% of these 364 patients were freed within six months after onset. Their study showed that the greatest incidence of removal from respiratory equipment occurred during the second and third months after onset, with a rapid decline thereafter to a low incidence. In the present series of patients, 66 were still in a respirator eight months or more after the onset.

This experience indicates that vital capacity is valuable in determining the need for respiratory aids but it is of much less value in determining when the patient will be removed from respiratory equipment. A rule of thumb which has been found useful is that patients with less than 10% of predicted normal vital capacity will require respiratory aid all the time, in most cases a tank respirator, at least during the night. Patients with vital capacities of 20 to 30% of normal require respiratory aid during part of the day but are able to go unassisted for small periods of time provided that their activities are not too strenuous. Patients whose vital capacities are 40 to 50% of normal may be completely freed of respiratory aid, depending on the breathing pattern their type of paralysis permits them to adopt. Dail and Affeldt[7] have emphasized the effect of body position on respiratory muscle function, and they have pointed out that certain patients breathe best in a supine position and others in the erect or sitting position. A number of these patients with less than 40% of normal vital capacity have been able to get along successfully with a less amount of respiratory aid when they wore a special spring compression abdominal belt which substituted for the paralyzed abdominal muscles.

Physical Impairment Status.—In the survey of Landauer and Stickle[1] previously quoted, the incidence of quadriplegia was 2.5% and paralysis of both arms occurred in 6% and of both legs in 16%. In our group of patients (fig. 2), 80 had quadriplegia, 10 had involvement of both upper extremities, and 5 had paraplegia. In three patients the involvement was spotty, involving many of the eight areas of the body previously mentioned. In two instances, although the extremities were nearly normal, the trunk and diaphragm were markedly involved and the patients required continued respiratory aid.

Since a few patients with types of serious disabilities other than poliomyelitis were also admitted to the center, the staff had an opportunity to evaluate the relative difficulties in rehabilitation management of these different types of disabilities. In their opinion, the traumatic cervical cord injury at levels of C-5 and C-6 provided more difficult problems of rehabilitation than did quadriplegia due to poliomyelitis in a patient who required respiratory aid. The patient with bilateral upper extremity amputation, however, presents less difficult problems of management than does the patient with poliomyelitis with bilateral flail upper extremities together with respiratory impairment.

Period of Treatment in the Center

Landauer[2] has reported that in 1956 the average period of rehabilitation for respirator patients in all the centers was approximately seven months, whereas patients without respiratory involvement required an average of 54 days in the centers. Figure 1 indicates the distribution of patients according to the varying periods of time required in the center for a satisfactory program to be completed. The average period was eight months, although it must be admitted that 15 of the patients required more than 12 months. When one applies the per diem cost of $25 to this group of patients, excluding teaching and research, the cost of the program in the center was $600,000. The Respiratory and Rehabilitation Center forms the hard core of a teaching program in rehabilitation[8]; thus, the costs of patient care, research, and education cannot be easily separated. It is our judgment, however, that this per diem figure represents costs of only basic patient care in the center.

Complications.—In this group of patients, the efforts of the rehabilitation team were frequently delayed or thwarted by varying complications. Dunning and Plum[9] have shown that severe diffuse paralysis is associated with hypercalciuria for periods as long as 50 weeks after onset. In this series, 38 patients had renal calculi detectable by x-ray. There undoubtedly were some others in whom their presence was not recognized except by occasional attacks of renal colic or recurring urinary tract infections.

Atelectasis was the next most common complication, occurring in 36 patients. It required constant alertness on the part of the staff during the winter months, particularly in those patients who had tracheostomy. Experience has shown that early closure of the tracheostomy helps to avoid this complication. The physicians were usually reluctant, however, to do this until the patient had 20-30% of his predicted normal vital capacity. Surprisingly enough, thrombophlebitis occurred in only five of the patients. This may be accounted for by the lower age level of these adults

I have presented elsewhere[10] gastrointestinal complications in this type of patient. One complication, gastric dilatation, was more frequent (occurring in eight patients in this group) than is usually seen in the average hospital population. As a result of experience with this complication at the center, it has been suspected that a number of unexpected deaths of patients with long-term respiratory paralysis in home care situations are secondary to this complication rather than due to the pulmonary insufficiency to which the death is usually attributed. One instance of pneumothorax followed the administration of positive pressure in a manner previously recorded in the literature.[4b] In view of the thousands of times that positive pressure has been used at this center to lessen the decrease in pulmonary compliance in patients with chronic respiratory paralysis, it was felt that this complication was of little significance. Other complications included gastric hemorrhage (five), thrombophlebitis (five), bronchiectasis (two), cardiac arrest (two), peptic ulcer (two), and myositis ossificans (one).

Surgical Procedures.—Many minor procedures, such as tracheostomy, cystoscopy, and others, are performed on these patients. Usually, major procedures are avoided unless it is felt that the procedure will result in a distinct contribution to the patient's rehabilitation. The creation of a useful hand, when possible, in the patients represented a great aid to the rehabilitation program. Therefore, tendon transplant of the opponens was the most common procedure, performed in 11 instances. Nickel and co-workers,[11] in a much larger series, have shown that patients with severe respiratory paralysis can be given the benefits of reconstructive surgery without too much risk, providing a team is available to handle the respiratory complications. Resection of the iliotibial band was done in one instance.

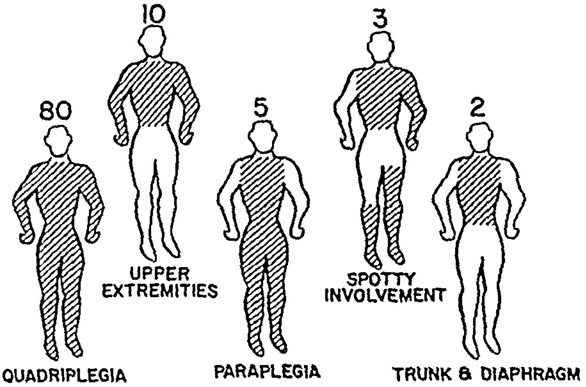


Fig. 2.—Physical impairment status of 100 patients on admission.

Most of the other procedures were urologic, done with the hope of developing methods of solving the problem of renal stones. These procedures included nephrectomy (one), cholecystectomy (one), pyelolithotomy (two), and cystolithotomy (four). After five years of experience, the urologic consultants reserve their procedures for those patients whose progress in the rehabilitation program gives definite promise of few recurrences of the renal complication.

Lobectomy as performed in one patient has been reported elsewhere.[12] This patient was the first one admitted to this center. It is interesting to note that he continues in a home care program five years later, although his vital capacity is less than 600 cc. In rehabilitation centers, the surgeon, except for the orthopedist and urologist, is often forgotten as a contributing member of the rehabilitation team. This may mean losing skills which are of great advantage to the patient.

Effect of the Center Program

When the Respiratory and Rehabilitation Center was established, there was considerable emphasis on the importance of freeing patients from any respiratory aid. Weaning programs were set up with this specifically as a goal. As the staff gained experience, it became apparent that one should sacrifice weaning speed when necessary to allow neuromuscular rehabilitation to proceed concomitantly. It is obviously more desirable to have a well-adjusted, clear-thinking individual using respiratory aid than to have a chronically underventilated, tired, stressed, and irritable patient who breathes unaided.

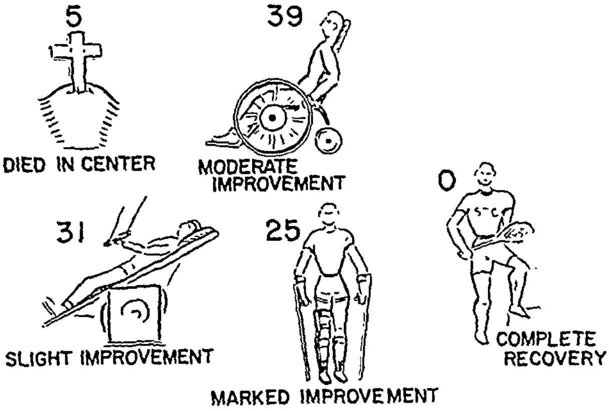


Fig. 3.—Effect of center's program of treatment on ability (100 patients).

Riley and Batson [13] have pointed out that success in weaning from respiratory aids is dependent on many factors, most important being the degree, extent, and distribution of paralysis. They noted that only 1 of 13 patients with more than 90% paralysis was completely freed of respiratory aid.

In the present series of patients, only 16% were freed of all respiratory aid. Ten per cent had their status unchanged. In 37% of the patients, the respiratory aid consisted only of a rocking bed at night. This was usually the case in the patient who had 25-30% predicted vital capacity but whose diaphragmatic paralysis was nearly complete. Some of the studies on such patients during sleep suggested that the arterial oxygen saturation declined and the carbon dioxide levels increased significantly, thereby placing the patient in a deficit from which he had to recover during the daytime.

Most striking, however, is the fact that 98% of the patients were freed of a tank respirator—an important gain, since it was often unsatisfactory to plan home care programs when tank respirators would be required in the home. Those patients who required more respiratory aid than was provided alone by the chest respirator or rocking bed could be managed with a rocking bed which was synchronized with a chest respirator. Only two of the patients required this special equipment.

The effect of the center's program on lessening disability or, conversely, the improvement of ability was more difficult to quantitate. Although use of a personal care rating scale and vocational rating scale, such as advocated by Hoberman and Springer,[14] would have been preferred, it was felt that the uniformity of the disability of the present series of patients was such as to not lend itself readily to such scales. Therefore, the improvement of ability was graded in terms of slight, moderate, marked, and complete recovery. It should be noted that figure 3 refers to the effect on ability. The lessening in physical impairment was in most instances slight, in some moderate; but where such factors as ability to perform some activities of daily living, use of adaptive devices, psychosocial adjustment, and a sense of a realistic goal were taken into consideration, the improvement in ability may be listed as is reported here. Thirty-one of the patients showed slight improvement, 39 moderate, and 25 marked. There were no complete recoveries.

In this group of patients, five died at the center. One patient died of pyelonephritis and hypertensive encephalopathy. A second patient died after resection of the iliotibial band. This death was due to cardiac arrest at the time of surgery. A third patient died after acute gastric dilation, despite all attempts to correct the severe distention and electrolyte imbalance created by this complication. A fourth patient had previously had a nephrectomy and subsequently developed pyelonephritis and a perinephritic abscess in the remaining kidney. The fifth patient was brought into the center in the last month of pregnancy with toxemia and congestive heart failure. This case was unusual in that a postmortem cesarean section was performed and, despite the severe hypoxia to which the patient had been subjected during the last trimester of her pregnancy, a live, normal infant was delivered who now, two years later, gives no evidence of any prenatal injury.

Disposition of Patients

Figure 4 indicates that, even with patients as severely paralyzed as this particular group, it is possible to return 80% of them to private home care programs. This point will be mentioned again, but the enormous saving in patient care costs which has resulted from the change from a hospital per diem cost to a home care program cost more than justifies the efforts of a specialized center. As Landauer [2] has pointed out, the best available patient care is the most economical in the long run and inadequate care is wasteful and expensive. The economics of the Respiratory and Rehabilitation Center are important considerations, but a detailed review of the 100 patients and specific case histories would be necessary to give the full picture of the humanitarian values that can be accomplished by this type of rehabilitation program.

Home Care Programs.—It was recognized from the onset that medical social service would be of great importance in coping with discharge plans of patients with severe, complex disabilities. Furthermore, the varied locations of the patients admitted to this center required that a medical social worker spend much time in travel. Prior to the discharge of each patient, the medical social worker surveyed the local resources of the community, the family, and the available medical facilities. Her visits did much to prepare a sound home care program. In a previous survey [15] of 35 patients, the manner and ease with which severely disabled patients could be integrated into home care situations, at much reduced cost to society, were impressive. Furthermore, an analysis of the day by day activities of that group of patients revealed that they were leading not only active lives but useful ones.

The stability of home care programs depends on three factors: 1. The degree of self-acceptance and acceptance of others which the patient is able to attain. The stay in the center, week-ends spent in the home environment, and local trips to shows, games, and other activities prepare the patient for the time when he must go home. 2. Acceptance of the patient by the family. This is achieved by unlimited visiting hours, regular counseling sessions with members of the family, and periodic home visits before final disposition. 3. Adequacy of the home facilities. This factor requires preliminary visits by the medical social worker, the securing of an attendant, if needed, and the training of an attendant and members of the family concerning the use of respirator equipment.

In a recent questionnaire survey of this group of patients, which was supplemented by data in the medical social service files, it was noted that 44% of this group of patients had no attendant at home but were cared for completely by the family. Thirty-six per cent required full-time attendants and 20% part-time attendants. The staff at this center feels that it is important that the home care situation be not so difficult as to jeopardize the integrity of the family. This point is carefully checked on subsequent readmissions of the patient for short evaluations. The staff is also kept informed by the regional medical social workers of the National Foundation for Infantile Paralysis, who make periodic visits to these patients throughout the United States.

In this recent survey, it was found that 88% of these patients in home situations still receive aid from the National Foundation for Infantile Paralysis. This primarily consisted of payment of salaries for the attendants, maintenance of respiratory equipment, and local medical care for minor supervision that would be needed. Occasionally, however, short periods of hospitalization have become necessary to tide the patient over an upper respiratory infection. Likewise, patients may be readmitted to the center for short periods of reevaluation, usually one or two weeks long, depending on the distance the patient lives from the center. Those in the immediate vicinity are seen on an outpatient basis at shorter intervals. How successful is such a home care program? The recent survey indicates that such programs have remained stable in 80% of cases. As was stated before, the reduction in cost to society more than justifies the economic expenditure on the program of rehabilitation. The gain in human dignity, the example of courage for others, and the maintenance of family strength for unity can only be documented by individual case histories.

Vocational Goals.—The success in attaining proper vocational goals is determined by a number of factors: (1) the natural and educational endowments of the individual; (2) motivation; and (3) vocational opportunity. In the survey of this group of patients, it has been found that 10% are employed full time. Among these are a corporation lawyer who completely supports himself and his family, farmers who direct the operation of their farms, insurance salesmen, magazine subscription salesmen, and others in similar occupations. Ten per cent of the group are employed in part-time activities. These usually are of a home-bound nature or office practice, such as accounting or reception work. Ten per cent of the group could be classified in the student category, in that they are pursuing their academic work in either high school or college. A group that has been of particular interest is the housewives, comprising 16%. They have continued in the role of the dominant central figure in the home situation, despite the fact that they have residual severe paralysis and require respiratory aid.

In 54% of the patients, no vocational goal was realized. That was attributed to a lack of the three factors enumerated. It is unrealistic to assume a vocational goal for a person who has quadriplegia, who requires respiratory aid, and who has an IQ

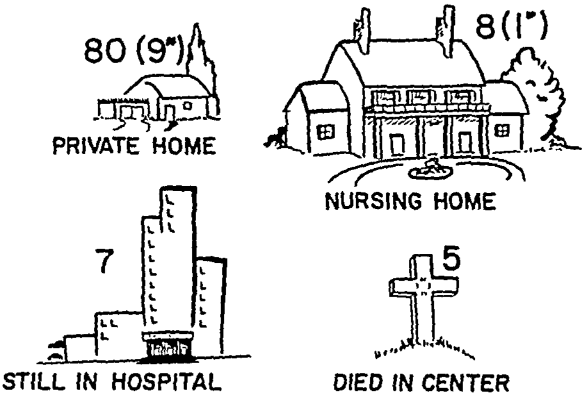


Fig. 4.—Disposition of 100 patients from center (9 died after disposition to private homes).

of 75. In a small percentage, the lack of motivation may have hindered realization of a vocational goal. More frequently, however, the lack of vocational opportunity was responsible. Many of the patients came from small communities scattered throughout many states. Although an excellent liaison was maintained with those state departments of vocational rehabilitation which were satisfactorily organized and as many of the patients were referred to such departments as was possible, experience has indicated that most of these departments were reluctant to undertake responsibility for the severely disabled patients. This was based on the difficulties that occurred in securing proper vocational opportunities for home-bound patients in agricultural areas. As time has gone by, there is improvement in this direction, particularly in some of these states. The placement of a severely disabled patient in a small agricultural community need not be more complex than similar placement in a large urban, industrial area. Considerable education of communities will be needed, however, before this can be accomplished. Emphasis is placed here on vocational goals not because it is believed that they are logical goals for these patients but because they represent the need of every human being to live a useful and productive life. This need should not be destroyed.

Comment

Subsequent readmissions of earlier patients has shown that rehabilitation goals are relative, depending on a number of factors. These are (1) rehabilitation readiness, (2) the growth of skills and competence in the team, and (3) untoward or unexpected complications. In the matter of rehabilitation readiness, it was often noted that the patient had been ill-prepared for the possibility of long-term disability, even though the onset of his disease had been many months prior to his admission to the center. When unrealistic goals had been given the patient, it was found that the rehabilitation process was greatly retarded. This occurred so regularly that most of the staff could predict its occurrence soon after the patient was admitted. This experience emphasizes that nearly all patients faced with the prospect of catastrophic disability react with severe depression at some phase in their illness. This depression may be manifested in different ways, depending on the personality structure present prior to the onset of the catastrophe. There is no simple rule of timing which enables one to predict the development of self-acceptance.

The second factor, namely, growth in competence and teamwork of the staff, was accomplished by the spirit of interchange and collaboration that has existed between the various centers. This was fostered by annual conferences on physiological, clinical, and psychological research on patient care and administrative problems.

The third factor, untoward or unexpected complications, continually plagued the Respiratory and Rehabilitation Center staff. This was particularly true during the winter months, with the attendant respiratory complications, and during the hot summer months, with the genitourinary and gastrointestinal complications. During the past winter, the Asian influenza epidemic resulted in problems of management for a few patients, although the center's population, as well as those who had been previously released, were protected by vaccination.

Summary

Although the Salk poliomyelitis vaccine has greatly reduced the incidence of poliomyelitis with respiratory involvement, there remains a group of respirator patients with long-term disability who will constitute the residue of epidemics for some years yet to come. A program of comprehensive care and rehabilitation for this type of patient is economically feasible and desirable.

A group of 100 respirator patients with long-term disability were studied to ascertain the value of a specialized center for the care of this type of patient. Vocational goals and home care programs may be realistically planned for the rehabilitation of such patients. The teamwork and skills required for the management of the patient with long-term respiratory paralysis are transferable to the care of those with lesser disabilities.

407 S. 16th St. (2).

Acknowledgement is made of the assistance of Sister M. Georgette, O.S.F., B.S.N., and other members of the staff of the Respiratory and Rehabilitation Center in compiling the data for this study.

This study was supported by a grant from the National Foundation for Infantile Paralysis, Inc.

References

1. Landauer, K. S., and Stickle, G.: Analysis of Residual Disabilities (Paralysis and Crippling) Among 100,000 Poliomyelitis Patients, with Special Reference to Rehabilitation of Postpoliomyelitis Patients, Arch. Phys. Med. **39:**145-151 (March) 1958.

2. Landauer, K. S.: Economic Value of Comprehensive Rehabilitation Programmes, in Proceedings of Seventh Congress, International Society for the Welfare of Cripples, London, July 22-26, 1957.

3. Benton, J. G., and Kriete, B. C.: Rehabilitation of Long-Term Respirator Patient, J. Chron. Dis. **4:**516-526 (Nov.) 1956.

4. (*a*) Neu, H. N., and Ladwig, H. A.: Medical Management of Long-Term Respirator Patient, J. Chron. Dis. **1:**160-167 (Feb.) 1955. (*b*) Neu, H. N., and Ladwig, H. A.: Problem of Long-Term Respirator Patient, Arch. Phys. Med. **37:**351-357 (June) 1956.

5. Spencer, W. A.: Treatment of Acute Poliomyelitis, ed. 3, Springfield, Ill., Charles C Thomas, Publisher, 1956.

6. Affeldt, J. E.; Bower, A. G.; Dail, C. W.; and Arata, N. N.: Prognosis for Respiratory Recovery in Severe Poliomyelitis, Arch. Phys. Med. **30:**290-295 (May) 1957.

7. Dail, C. W., and Affeldt, J. E.: Effect of Body Position on Respiratory Muscle Function, Arch. Phys. Med. **38:**427-434 (July) 1957.

8. Neu, H. N., and others: Teaching Program in Rehabilitation, Nebraska M. J. **42:**423-429 (Sept.) 1957.

9. Dunning, M. F., and Plum, F.: Hypercalciuria Following Poliomyelitis: Its Relationship to Site and Degree of Paralysis, A. M. A. Arch. Int. Med. **99:**716-731 (May) 1957.

10. Neu, H. N.: Gastrointestinal Complications in Poliomyelitis, in Proceedings of Fourth International Congress on Poliomyelitis, New York, National Foundation for Infantile Paralysis, 1958.

11. Nickel, V. L.; Perry, J.; Affeldt, J. E.; and Dail, C. W.: Elective Surgery on Patients with Respiratory Paralysis, J. Bone & Joint Surg. **39:**989-1001 (Oct.) 1957.

12. Neu, H. N., and McCarthy, H. H.: Lobectomy in Chronic Respirator Patient, A. M. A. Arch. Surg. **72:**284-286 (Feb.) 1956.

13. Riley, H. D., Jr., and Batson, R.: Poliomyelitis Patient with Respiratory Failure: Diagnosis, Management, and Results of Treatment, South. M. J. **50:**1357-1368 (Nov.) 1957.

14. Hoberman, M., and Springer, C. F.: Rehabilitation of Permanently and Totally Disabled Patient, Arch. Phys. Med. **39:**235-240 (April) 1958.

15. Still, C., and Neu, H. N.: Psychosocial Factors in Home Care Programs of Long-Term Respirator Patients, J. Chron. Dis. **7:**121-130 (Feb.) 1958.

THE PATIENT AND PHYSICIAN IN CARDIAC SYMPTOM FORMATION

ANGINAL SYNDROME

William N. Chambers, M.D., Hanover, N. H., Joseph L. Grant, M.D., White River Junction, Vt.
and
Kerr L. White, M.D., Chapel Hill, N. C.

In the past 15 years there have been numerous articles concerning the role of the physician in causing symptoms and disability, particularly in relation to the heart.[1] The term "iatrogenic disease" is common. It has been stated that physicians may be potent mobilizers of anxiety in patients and may often initiate disabling illness by poorly considered remarks, acts, or unjustified restrictions. Physicians are warned to be cautious in what they say or do before patients and are admonished to avoid the slightest misunderstanding, lest they set in motion the progression of symptoms which will eventually result in the invalidism of a previously healthy person.

This study is an attempt to evaluate the part of both patient and physician in the formation of symptoms suggestive of angina pectoris, especially in patients with normal hearts. Our interpretation indicates that the majority of such patients have neurotic patterns well established and that excessive concern with their hearts already has taken place by the time a physician is consulted. However, the doctor may fail to recognize that the symptoms are primarily related to anxiety and, as a result, may misinterpret them. In a surprisingly large number of instances, the diagnoses of angina pectoris and even myocardial infarction are made when in reality there is no heart disease. The physician erroneously confirms the patients' fears about their hearts and makes the task of dislodging these fears more difficult. On the other hand, the physician may fail to make the diagnosis of coronary artery disease, when it is present, because of the bizarre nature of symptoms which do not fit the rigid clinical criteria for the syndrome.

This study is an attempt to evaluate the part of both patient and physician in the formation of symptoms suggestive of angina pectoris, especially in patients with normal hearts. The data indicate that the majority of such patients have neurotic patterns well established and that excessive concern with their hearts already has taken place by the time a physician is consulted. However, the doctor may fail to recognize that the symptoms are primarily related to anxiety and as a result may misinterpret them, making a diagnosis of angina pectoris or myocardial infarction, when in reality there is no heart disease.

Method

Fifty-five consecutive patients with chest pain were studied and followed during a six-year period. Earlier observations on this group of patients have been published.[2] Each patient had a thorough his-

---

Staff member in Internal Medicine, Hitchcock Clinic, Mary Hitchcock Hospital; Assistant Professor in Medicine, Dartmouth Medical School, Hanover, N. H.; and attending physician in Internal Medicine, Veterans Administration Hospital, White River Junction, Vt. (Dr. Chambers); Chief of Medicine, Veterans Administration Hospital, White River Junction, Vt.; and Instructor in Medicine, Dartmouth Medical School, Hanover, N. H. (Dr. Grant); and Associate Professor of Medicine, University of North Carolina (Dr. White).

tory and physical examination, routine laboratory studies, and x-rays of the chest, gallbladder, and upper gastrointestinal tract. Master's two-step test was performed on all patients who did not have electrocardiographic evidence of myocardial infarction. Other studies were obtained when indicated. Social and personal data were secured from the patient, his relatives, social workers, and hospital records. Because the community is rural and the population relatively stable, in many instances the medical records of the patients' entire lives were available for study. Psychological evaluation was carried out by psychodynamically oriented interviews. A minimum of two hours and, in most cases, more than four were spent with each patient, in addition to time required for the medical aspects of diagnosis, treatment, and follow-up. The factors resulting in the development of symptoms interpreted as "heart disease" and the attitude of the patient and his doctors toward his condition were carefully recorded. An attempt was made to evaluate the patient's and the physician's part in the development of these cardiac symptoms.

There were three groups: 1. Twenty-five patients had classic angina pectoris for at least six months followed by a well-documented myocardial infarction. 2. Twenty-seven patients had cardiac neurosis; they complained of chest discomfort and other symptoms which they referred to the heart, but clinically there was no evidence of angina pectoris or other heart disease. 3. A third group of three patients had chest pain suggesting one of the first two diagnoses but not completely fulfilling the criteria for either. This paper will consider the patients in the first two groups.

The original study was completed six years ago. At that time there were 20 patients in the angina pectoris group, 20 in the cardiac neurosis group, and 15 in the third group. It has since been possible through follow-up studies to clarify the cause of chest pain in 12 of the 15 patients in the third group. Seven of these patients have been put in the cardiac neurosis group and five in the angina pectoris group. None of the patients originally classified as having cardiac neurosis or angina pectoris were changed. Eleven of the patients with angina pectoris have died. No patients in the cardiac neurosis group have died.

Results—Cardiac Neurosis

The Patient's Role in Cardiac Symptom Formation.—Direct reference to the heart was made by 19 of the 27 patients in the cardiac neurosis group on first consulting the physician. These patients were convinced that they had heart disease despite no previous contact with a doctor. Although the other eight patients did not refer directly to their hearts, they complained of chest pain and further questioning showed that they also had long-standing and excessive fear of heart disease. When these patients with cardiac neurosis were seen later in consultation, 15 who had never been told they had heart disease by their referring doctors were as convinced that they had heart disease as the 12 patients who had repeatedly been told erroneously that they had heart disease. Six patients inferred from their physician's comments that they had heart disease. Eight patients made statements which careful documentation has established as extreme exaggerations concerning what their physicians had told them about their hearts, and four patients definitely misrepresented facts.

The average number of doctors consulted by each patient in the cardiac neurosis group was 4.7 compared to only 1.5 for each patient with angina pectoris. The patients in the former group went from doctor to doctor seeking satisfactory explanations of their symptoms and attempting to obtain confirmation of their beliefs that they had heart disease. Many of these patients had been referred to the investigators for further medical consultation because they had not been satisfied with the original opinion that they had normal hearts or because their physicians were uncertain of the diagnosis. Eight patients had been seen by six or more physicians concerning their heart complaints. Seventeen patients had been referred one or more times by their own physician for further opinion. Fourteen patients sought other opinions by going from doctor to doctor without being referred. It was not unusual for these patients to be consulting a number of physicians simultaneously for opinions and treatment, apparently deriving different satisfactions from each. Several patients in the group maintained a balance between their family physicians, who treated them with cardiac drugs, and the consultants, who did not agree that they had heart disease. One of these patients, who had been seen by one consultant for several years, changed to another consultant who accepted her need for believing that she had heart trouble, when the first physician became insistent that she did not have heart disease. It was apparent that, if a patient had been studied a number of times with varying diagnoses, the positive diagnosis usually was given by the patient. If the final opinion was that the patient's heart was normal, these patients insisted all the more that they did have heart disease despite attempts at reassurance.

Ninety per cent of the patients in the cardiac neurosis group had a strong tendency to dramatize their symptoms. They described these graphically and referred to their "heart disease" or "heart pain." This was in striking contrast to the patients with angina pectoris, who often tended to deny their complaints and seldom talked directly about their hearts. The phobic, hysterical, and hypochondriacal tendencies observed in the former group of patients were marked. It was also apparent that they had experienced intense anxiety throughout their lives. The anxiety was focused with varying degrees of intensity on the heart. In some patients, under certain circumstances this would shift from the heart to other organ systems. Such patients tended to identify with relatives, close friends, associates, or public figures who had, or who were thought to have had, heart disease. These relationships often were not close.

The onset of chest pain in every patient with cardiac neurosis was preceded by increasing emotional tension and was often associated with deterioration in the life situation. Usually, there was a superimposed threat to his interpersonal security at the time the symptoms developed. In 17 of the 27 patients with cardiac neurosis, 18 definite organic conditions not related to the heart contributed to the chest pain. Similar organic lesions failed to produce pain in six other patients in the group. In 10 of these patients with cardiac neurosis, no anatomic disease was found by the diagnostic means employed. It was apparent that a consideration of organic pathology alone was inadequate to understand completely some of the patients' "anginal" pains and their anxieties.

The patients with cardiac neurosis showed a high degree of secondary gain. In some, the pain represented a mechanism for setting limits to their activities and freed them temporarily from intense pressures or responsibilities. It seemed to act as a means of getting attention and of controlling immediate members of the family. In others, the pain represented an acceptable "excuse" for failing to attain life objectives. Monetary compensation played a large part in six patients who had been discharged from military service with an incorrect diagnosis of angina pectoris and in one patient in civilian life. All of these patients had regressed to markedly dependent states of existence. When the diagnosis of heart disease was not confirmed and withdrawal of compensation became imminent, these patients uniformly became resentful and continued to insist on the presence of heart disease. One patient in this group collected testimonial statements from his friends, many of them sworn and notarized, to prove the presence and the severity of his chest pain. A second patient, a 25-year-old steamfitter who had received 60% compensation for four years, was evaluated completely at a Veterans Administration hospital; the diagnosis of coronary artery disease was not confirmed, and his compensation was revoked. Being dissatisfied, he gained admission to another VA hospital, where the diagnosis of angina pectoris was made, and the compensation was reinstituted. A 50-year-old conductor and morphine addict had received compensation for coronary artery disease for 10 years. On review of the problem, the diagnosis was not confirmed and his compensation was revoked. Two days later, while on leave from the hospital, he committed suicide.

The Physician's Role in Cardiac Symptom Formation.—Four of the 27 patients in the cardiac neurosis group developed abnormal anxiety concerning their hearts only after being told by their original physicians that heart disease was present or suspected. In these patients, the physicians' attitudes were considered the primary factors in mobilizing anxiety and aggravating symptoms, either by excessive concern over the complaints or by evident doubts about the diagnoses.

The remaining 23 patients in the cardiac neurosis group had an abnormal degree of anxiety concerning their hearts before visiting their doctors. In 12 of these patients the fears were confirmed and increased when they learned that heart disease was, indeed, present or suspected. With each of these patients it is considered that the physician's role was of secondary importance in mobilizing anxiety and symptoms related by the patient to his heart.

In the 23 patients with angina pectoris, none were found in whom a physician was considered to be a primary factor in the production of symptoms, but in 4 patients it was considered that physicians did augment the patients' fears by their attitudes.

Although abnormal anxiety about heart disease appeared to have originated within the patients, it was unwittingly encouraged and augmented by physicians. Of the 27 patients with cardiac neuroses, 12 had been told previously, by two or more physicians, that they had "heart trouble." A diagnosis of myocardial infarction had been made in eight of these patients, and they all had been treated for this condition one or more times in civilian or VA hospitals.

In reviewing the past records, it was noted that in the same patient the diagnosis of coronary artery disease was made repeatedly by some physicians and denied by others. The family physicians had made a diagnosis of coronary artery disease 12 times in these eight patients, whereas a diagnosis of no heart disease was made only once. The consultants made diagnoses of coronary artery disease three times and of no heart disease five times. Physicians in the armed forces diagnosed coronary artery disease four times in these patients, although they diagnosed no heart disease six times. Physicians in the VA hospitals made a diagnosis of coronary artery disease eight times. No evidence of heart disease was found in any of these patients during the final evaluations.

CASE 1.—In a 50-year-old loom fixer, a diagnosis of coronary artery disease had originally been made during military service in World War II but was denied during the same year at two different military hospitals. The following year a diagnosis of coronary artery disease was made by the family physician. Subsequently, a diagnosis of heart disease was made by the consulting cardiologist. The same patient presented himself in 1947 and 1951 at VA hospitals with the same complaint, but no evidence of coronary artery disease was found on either occasion.

CASE 2.—A 42-year-old accountant was treated for acute myocardial infarction in 1951. Review of his record showed that he was studied at a military hospital during his service three different times between 1942 and 1945 for complaints referred to the heart but no heart disease was found during each of these three periods of study. Subsequently, this patient was studied at the VA hospital on two separate occasions in 1956 for the same complaints, and again no evidence of heart disease was found.

CASE 3.—A 52-year-old public relations expert was originally told by his family physician that he had coronary artery disease in 1941. This diagnosis was later confirmed at a VA hospital five times in 10 years. A diagnosis of angina pectoris was made at a large medical clinic in 1946. However, no evidence of heart disease was found in the same patient in another large clinic in 1952, as well as at the VA hospital in 1950, 1955, and 1957.

Results—Angina Pectoris

Although there was less confusion concerning diagnosis in the 25 patients with organic heart disease, many difficulties were encountered here also. This was often because of the extreme degree of denial, insistence on continuing physical activity, atypical nature of symptoms, and, frequently, the patient's failure to consult the physician for some time after the onset of symptoms. Incorrect interpretation of the electrocardiogram was a further source of mistaken diagnoses.

The need for careful evaluation of symptoms and findings and for other consultations often accentuated the concern of patients who originally had not focused on their hearts but had even denied their symptoms. As time went on, these patients frequently came to observe every minor bodily sensation. One patient who originally had completely denied his symptoms gradually became excessively concerned during several weeks of indecision and study by the physician. Waking himself at night to record symptoms in a diary, he also kept elaborate charts indicating episodes of pain, all carefully marked with red and black pencils. Finally, with clarification of the diagnosis and the outlining of a specific program, his anxiety decreased and he returned to more normal activity.

Other patients with coronary artery disease were overtly terrified and behaved as though any physical or emotional strain was too great for them. They seemed to have "wrapped themselves in cotton wool." Three patients in the group manifested an exaggerated form of this behavior. No encouragement or reassurance was of any avail in freeing them from their fears or helping them to return to more normal and productive lives. These three men all assumed passive roles in their households, managing some of the domestic duties while their wives went out to work. Even though they were preoccupied with their extreme disabilities, they continued to deny that their pains were due to heart disease and insisted that they were due to indigestion or some other noncardiac cause. In contrast, many patients continued heavy physical activity after their initial episodes of coronary thrombosis despite the urgent advice of the physicians to the contrary.

Many of these patients seemed to work through various stages of inability to adjust to their diseases as manifested by either denial or invalidism, but then they finally accepted it and lived constructively within their newly imposed limits.

The severity of angina pectoris definitely appeared to be altered in many instances by the physician's attitude and by supportive psychotherapy. This was particularly apparent in three patients who were originally incapacitated more by fear than by pain but who gradually were emancipated through careful management and finally were able to carry on active lives.

Atypical chest pains and other symptoms in patients with known angina pectoris presented difficult and confusing problems. Striking differences often occurred in ability to perform physical activity. At times, a patient was able to plow an entire field with no pain, whereas, on other days, merely bending over induced an attack of angina. The atypical chest pain often misled the physician in the management of the patient. There was often failure to recognize that patients with angina pectoris may also have severe degrees of cardiac neurosis with excessive concern about their hearts. Another source of difficulty in diagnosis was the presence of other organic lesions which could also be associated with chest pain. One patient was convinced he had angina pectoris. His physician refused to make this diagnosis and insisted that the pain was due to a hiatus hernia. The patient then went to a large clinic where a definite diagnosis of coronary artery disease with angina pectoris was made. The patient returned to his original physician who angrily denounced the clinic and its opinion and stated, "I am still convinced that you do not have heart disease." The patient then changed to a physician who agreed with the diagnosis of angina pectoris.

Comment

From this study of 55 consecutive patients with chest pain, it is apparent that many are convinced that they have heart disease even though it is not present. These patients have a well-developed group of symptoms which they refer to the heart despite the fact that they have had no previous contact with a physician concerning this problem. They have a tendency to consider that any discomfort or pain in the chest denotes heart disease. They dramatize their symptoms and identify with other people with heart disease. Their fears are augmented when they are under increased emotional tension, particularly when there are threats to interpersonal security. The degree of incapacity resulting from such "heart disease" varies, depending on the personality of the individual and his needs at the specific time. Some are totally incapacitated, whereas others are able to lead an active and constructive life in spite of their symptoms. Patients who have received various types of compensation because of their heart disease often regress to a complete state of invalidism. If this compensation or the need for invalidism is questioned, they become angry and defensive and use many methods to insure continuation of the compensation. Once an individual has allowed himself to regress to this stage of dependency, it is difficult or impossible for him to relinquish this way of life even though the diagnosis of heart disease has been disproved. Their eventual incapacity equals the most serious types of heart disease. Sudden withdrawal of long-continued compensation may be disastrous. It seems highly probable that the conviction that they have heart disease may be essential for the functioning of some patients in life at certain times. It may represent a necessary defense against potentially overwhelming anxiety. Under these circumstances it is often advisable to allow the patient to maintain his cardiac neurosis even to the point of continuing some form of cardiac regimen.

The concept of iatrogenic heart disease stresses the culpability of the physician in the initiation of the cardiac neurosis. Our data suggest that only rarely does the doctor actually provoke the earliest symptoms of this disorder. We are aware of the potential role of the physician's remarks and attitudes in the formation of symptoms and in increasing fears and disability in patients. However, during this study we became aware of the frequency with which patients' excessive fears and convictions concerning their heart disease occurred before there had been any contact with a physician. We have no intention of justifying the physician or condoning his errors in diagnoses, but we do believe it is important to recognize that the source of the cardiac neurosis lies in the patient's, not the doctor's, personality. There appears little basis for the uncritical acceptance of the prevalent concept of iatrogenic heart disease. We are in agreement with Hart,[16] who stated that, in cardiac neurosis, heart symptoms are present long before the allegedly iatrogenic statement or suggestion.

The physician is often responsible for serious mistakes in diagnosis and treatment of patients with chest pain, frequently making a diagnosis of angina pectoris and even myocardial infarction when no heart disease is present. He may also aggravate preexisting abnormal anxiety about the heart by evident doubt about the diagnosis or excessive concern over the patient's symptoms. Furthermore, the physician must recognize that his opinion concerning the diagnosis may be only one of many to which the patient is exposed. This may be either because the patient voluntarily changes physician or because of the nature of modern medicine in which the patient's medical care is fragmented and responsibility is divided between the family physician, several consultants, diagnostic centers, and civilian, military, and VA hospitals. The emphasis is primarily on establishing a diagnosis and not in understanding the patient and his symptoms. In this way there may be repeated changes of diagnoses. In a VA hospital it is not unusual to find that one physician has made a diagnosis of angina pectoris and the patient has been given full disability. On a later hospitalization, another physician, having studied the problem thoroughly, finds no evidence of heart disease and all compensation is withdrawn. Under these circumstances the patient, not satisfied with a diagnosis in one hospital, may gain admission to another where the diagnosis he is seeking is confirmed.

Because of the subtle problems often involved in the diagnosis of angina pectoris, the patient's emphasis on his chest pain and preoccupation with other cardiac symptoms are potent factors which encourage unwary physicians to make the diagnosis of heart disease. Every physician is aware of the difficulty of making a specific diagnosis of heart disease in a patient whose symptoms are not clear-cut and in whom laboratory findings are equivocal. If the physician is not convinced of the diagnosis, it is often difficult for him to convince the patient. We believe that it may be harmful to positively tell the patient that he has no disease when there is doubt. If the patient is anxious already, further anxiety may be mobilized by unwarranted and superficial "reassurance" by the physician. The emphasis must be on a more fundamental understanding of the underlying sources of the patient's anxiety and his conflicts.

The diagnosis of angina pectoris is frequently difficult to make because of either the atypical nature of many of the symptoms or the patient's tendency to deny the presence of pain. Other patients with angina pectoris accentuate their symptoms and become incapacitated because of their excessive concern about themselves. The severity of angina pectoris and the degree of incapacity can be influenced in some instances by the physicians' and patients' attitudes and by psychotherapy. The patient with angina pectoris often has a cardiac neurosis which is equally severe. Such patients may have excessive reactions to their disease and to their physical sensations. The anxiety in turn may augment the frequency and severity of the anginal attack.

It often is thought that a dignosis of cardiac neurosis excludes the diagnosis of angina pectoris or that if angina pectoris is present cardiac neurosis does not complicate the problem. Actually, it is impossible to divide a patient's response in this way. Diagnosis by exclusion is usually difficult and frequently wrong. The real problem is to determine how many of the patient's symptoms are related to coronary artery disease and how many are due to the cardiac neurosis. If the physician can realize that the patient's symptoms are manifestations of his reactions, whether due to coronary artery disease or to neurotic anxiety about his heart, then he will be able to help the patient to make a more satisfactory adjustment. This will not necessarily "cure" the heart disease or the neurosis, but it will help the patient to understand his symptoms and how he can live with them.

Summary and Conclusions

Fifty-five patients with chest pain of anginal type have been studied comprehensively and followed for six years. Twenty-seven of these patients had no evidence of heart disease but were convinced of its presence. The neurotic pattern was well established and the cardiac fixation had already taken place by the time they came to the physician. They tended to dramatize their symptoms and often would refer to their "heart pain." They were all intensely anxious people whose neurotic behavior was readily apparent. In 17 of these patients organic conditions not related to the heart contributed to the pain. Monetary and other forms of compensation were strong forces in prolonging and aggravating the incapacity. They consulted many different physicians, occasionally receiving independent treatment from two doctors at once. All patients were convinced that they had heart disease whether or not they had had previous contact with the physician. These patients often misinterpreted and exaggerated the physician's remarks.

The physician was found primarily culpable in precipitating the cardiac neurosis in four of the patients. The physician confirmed and aggravated preexisting fears in 12 patients. In the remaining 11 patients he was considered to have had no direct effect. The physician often failed to recognize that the symptoms were due to anxiety and, as a result, misinterpreted them. A diagnosis of angina pectoris had been made one or more times in these 12 patients in whom no evidence of heart disease could be demonstrated. Eight patients without evidence of heart disease had been diagnosed as having myocardial infarction 27 times. They were said to have had normal hearts 22 times during the same interval of time. A misdiagnosis in favor of organic heart disease was made most frequently by the family physician. On the other hand, the physician often dismissed the diagnosis of coronary artery disease when in reality it was present because of the bizarre nature of symptoms that did not fit rigid clinical criteria for the syndrome.

The patient with cardiac neurosis has a well-developed group of symptoms which he refers to his heart. He is frequently convinced he has heart disease before consulting the physician. The physician may aggravate the patient's fears by his indecision, incorrect diagnosis, and failure to understand the cause of the patient's anxiety. The physician is often unable to be certain about the differential diagnosis between angina pectoris and cardiac neurosis and is frequently culpable of misdiagnosis in favor of organic heart disease.

The diagnosis of heart disease is often dismissed when actual disease is present because of the patient's behavior and the atypical nature of his symptoms. This confusion is greatly increased when the patient is exposed to several physicians over a number of years, each of whom may have varying opinions concerning the diagnosis. The criteria for the diagnosis of angina pectoris and cardiac neurosis must be reevaluated in the direction of the total individual response and not simply of the disease entity itself.

2 Maynard St. (Dr. Chambers).

References

1. (*a*) Wood, P.: Aetiology of DaCosta's Syndrome, Brit. M. J. **1:**845-851 (June 7) 1941. (*b*) Auerback, A., and Gliebe, P. A.: *Iatrogenic Heart Disease:* Common Cardiac Neurosis, J. A. M. A. **129:**338-341 (Sept. 29) 1945. (*c*) Goldwater, L. J.; Bronstein, L. H.; and Kresky, B.: Study of 175 "Cardiacs" Without Heart Disease, ibid. **148:**89-92 (Jan. 12) 1952. (*d*) Weinberg, H. B.: Iatrogenic Heart Disease, Ann. Int. Med. **38:**9-22 (Jan.) 1953. (*e*) Oille, J. A.: Cardiac Neuroses, Canad. M. A. J. **45:**1-7 (July) 1941. (*f*) White, K. L.; Grant, J. L.; and Chambers, W. N.: Angina Pectoris and Angina Innocens, Diagnosis and Management of Chest Pain, Psychosom. Med. **17:**128-138 (March-April) 1955. (*g*) Hart, A. D.: Iatrogenics and Cardiac Neurosis—Critique, J. A. M. A. **156:**1133-1138 (Nov. 20) 1954.

CARDIAC ARRHYTHMIAS IN EXPERIMENTAL SYNCOPE

Capt. George Dermksian (MC), U. S. A. F.
and
Lawrence E. Lamb, M.D., Randolph Air Force Base, Texas

The frequency with which a history of one or more syncopal episodes is elicited among aviation cadets in a flying training program was found to depend on the circumstances of the questioning. When anonymity seemed to be assured, 15 out of 50 admitted having had previously undisclosed syncope. Carotid sinus massage and certain breathing maneuvers were used to induce experimental syncope. During these procedures 21 of the 50 had one or more syncopal episodes. Arrhythmias were seen in 15 of the 21 who fainted and in 22 of the 29 who did not faint. Cardiac arrhythmias were not induced in any case by respiratory maneuvers after administration of atropine. The experimental procedures were not able to identify the subjects who had previously experienced syncope. The results argue against the supposition that syncope itself indicates an underlying disease state.

Loss of consciousness presents a serious problem to modern aviation and in critical areas of industry. Syncope is commonly seen at the blood bank, during inoculations, in the dentist's chair, and during moments of stress. Although its occurrence is well known, little information is available concerning the likelihood of its recurrence in any individual or its actual relationship to experimental syncope. It is common practice to study the problem of syncope with orthostatic measures utilizing the tilt-table or eliciting well-known reflexes such as the reflex resulting from carotid sinus massage.

Interest in this problem began with the discovery of significant cardiac arrhythmias occurring with simple respiratory maneuvers.[1] Some of these were associated with syncope. The respiratory system must make constant adaptations to changes in the environment associated with flight and altitude exposure. This facet of information as related to syncope seemed worthy of further exploration. Eighty-two apparently healthy persons engaged in flying activity who had experienced syncope were studied,[2] 55 of these with special procedures. It was impressive to note the number of cardiac arrhythmias that occurred in this series, and it was equally impressive to note the relation of cardiac arrhythmias to the experimental production of syncope. Of the group studied by experimental procedures, breathing maneuvers such as breath-holding at the height of inspiration and breath-holding after hyperventilation were most rewarding in illustrating the problem of cardiac arrhythmia as related to syncope.

In the previous study, the subjects evaluated all had admitted to episodes of syncope for which their future flying careers were placed in jeopardy. It was felt that it would be informative to study, by a similar battery of tests, a group of young flying personnel who had previously denied syncope. This also provided an opportunity to more carefully evaluate the role of atropine in both creating and preventing syncope in such a group. Atropine was used in only a few instances in the previous study. This report is based on the studies of this group.

Methods and Materials

Fifty healthy cadets in preflight training were brought to the School of Aviation Medicine for syncope evaluation. They were volunteers who were told only that they would serve as experimental subjects for tests at the School of Aviation Medicine. The nature and purpose of the tests was not disclosed in advance. As an incentive, each was guaranteed extra time off from duty. The cadets represented a relatively young age group. Their age span was from 19 to 27 years, and their average age was 21.1 years.

All of these individuals had denied previous syncopal episodes in order to gain admittance to the aviation cadet flying training program. All subjects had been previously examined. They were subjected to a battery of special procedures to test the cardiovascular system. This included observation of the patient's blood pressure, pulse, and symptoms and signs at rest and on a tilt-table. The subjects performed breathing maneuvers which included (1) breath-holding at the height of maximum inspiration without bearing down, (2) prolonged breath-holding, (3) hyperventilation, and (4) breath-holding after hyperventilation. These were repeated in the standing and recumbent positions. The carotid sinuses were massaged for 15 seconds' duration, and the subject underwent a 15-minute orthostatic tolerance test on the tilt-table. After these procedures, the subject received atropine, 1/50 grain (1.2 mg.), and the respiratory maneuvers were repeated.

Each subject was assigned a number which he selected from a hat. He was not identified by name and was assured that no further attempts would be

---

From the School of Aviation Medicine, Randolph Air Force Base, Texas.

Clinical Findings in Fifty Persons Subjected to Study for Syncope

Case No.	Age	Clinical History	Experimental Findings
1	20	None	Breath-holding caused shift of pacemaker to atrial focus; subsequent to atropinization,* breath holding failed to produce shift
2	20	Syncope after bilateral carotid occlusion Syncope 3 hr. after immunization	Breath-holding caused shift in pacemaker to atrial focus; once precipitated, other respiratory maneuvers could produce shift; two atrial premature contractions were noted; after atropinization, no arrhythmia was noted
3	22	None	Breath-holding resulted in sinus bradycardia; carotid sinus massage caused marked slowing to 38 beats per minute associated with near syncopal episode; two min. after carotid sinus massage, rhythm changed to nodal rhythm, then to normal sinus rhythm, then to A-V dissociation; hyperventilation followed by breath holding induced atrial rhythm; after atropinization no changes in pacemaker or cardiac rhythm could be induced
4	22	None	No findings
5	23	At age 13 fainted after breaking finger	During base-line studies, when first placed on tilt-table experienced 3 sec. of asystole followed by escape, followed by another 6-sec. period of asystole and escape; after recurrent episodes of asystole, patient developed nodal rhythm, and syncope occurred
6	23	None	Immediately after left carotid sinus massage, felt weak and faint; 2 min. later developed period of asystole followed by syncope; asystole terminated by ventricular escape beat, short period of atrial flutter, and, finally, resumption of normal sinus rhythm; after breath-holding, A-V dissociation with nodal rhythm occurred; after atropinization no arrhythmia could be elicited by breathing maneuvers
7	20	None	No findings
8	20	None	After prolonged breath-holding, change in PR interval to 0.08 sec. with upright T waves in all leads; after atropinization breath-holding produced no changes from normal sinus rhythm
9	20	Syncope at age 12 induced by chest squeeze during breath-holding after period of hyperventilation	Prolonged breath-holding caused change to atrial focus; at height of inspiration with breath-holding, period of second-degree A-V block; prolonged breath-holding followed by episodes of second-degree A-V block and syncope; after atropinization breath-holding produced no changes from normal sinus rhythm
10	20	Syncope at age 18 during chest squeeze in full inspiration after hyperventilation	Breath-holding caused shift to atrial focus and atrial rhythm; breath-holding after hyperventilation induced one ventricular premature contraction; after adequate atropinization, no arrhythmias could be induced by breathing maneuvers
11	20	None	After breath-holding, atrial rhythm appeared; after atropinization no arrhythmia could be induced
12	22	None	After breath-holding there was shift in pacemaker to atrial focus followed by bradycardia which persisted for 2½ min., then A-V dissociation, nodal rhythm, and syncope; after atropinization no arrhythmia could be induced by breathing maneuvers
13	21	At age 16 was sitting with feet on stove; got up, yawned, and passed out	Breath-holding caused a shift in pacemaker to secondary atrial focus
14	20	None	Right carotid sinus massage caused change in pacemaker to secondary site; 2 min. after massage, patient had near syncopal episode; breath-holding caused shift in pacemaker to secondary atrial focus; after atropinization no arrhythmia could be induced by breathing maneuvers.
15	22	At age 20 years, syncope associated with orthostatic hypertension	On release of breath after prolonged breath-holding, one ventricular premature contraction noted; during hyperventilation, one ventricular prematurity noted and after tilt to the horizontal position, one atrial premature contraction occurred; after adequate atropinization no arrhythmias were noted
16	21	None	Right carotid sinus massage caused change in pacemaker to secondary atrial focus; after breath-holding, atrial rhythm and atrial fusion beats noted; breath-holding after hyperventilation produced atrial rhythm with second-degree A-V block, and A-V dissociation with syncope; breath-holding with patient in recumbent position also produced atrial rhythm; after atropinization, breath-holding produced no changes from normal sinus rhythm
17	19	None	With patient first placed on tilt-table to obtain baseline blood pressures and studies, A-V dissociation with nodal rhythm occurred and was associated with syncope
18	21	Syncope at age 18 while marching in sun while ill with influenza	Breath-holding after hyperventilation caused drop in blood pressure with progressive slowing of cardiac rate and syncope
19	20	Syncope at 8 yr., after injection	After prolonged breath-holding, A-V dissociation and nodal rhythm (rate 40/min.), followed by syncope; after atropinization, breath-holding produced no changes from normal sinus rhythm
20	23	None	Breath-holding caused shift in pacemaker to secondary atrial focus; after atropinization, breath-holding produced no changes from normal sinus rhythm
21	21	None	Breath-holding produced immediate slowing of pacemaker and change to atrial rhythm; this was successively repeated with breath-holding; after atropinization, breath-holding produced no changes from normal sinus rhythm
22	21	None	Occasional ventricular premature contractions throughout study
23	21	None	Breath-holding resulted in shift in pacemaker to secondary atrial focus; after atropinization, breath-holding produced no changes from normal sinus rhythm
24	21	None	No findings
25	20	None	Breath-holding caused shift in pacemaker to secondary site; after atropinization, breath-holding produced no changes from normal sinus rhythm

Clinical Findings in Fifty Persons Subjected to Study for Syncope—continued

26	20	None	Left carotid sinus massage followed by sinus arrest with modal escape beat; breath-holding caused sinus brandycardia with A-V block and nodal escape associated with drop in blood pressure and syncope; thereafter every breath-holding episode could cause change in pacemaker to atrial focus; after atropinization dissociation and changes in pacemaker noted; after adequate time for complete atropinization, patient entered normal sinus rhythm which persisted despite breathing maneuvers.
27	22	None	Breath-holding resulted in shift in pacemaker to secondary atrial focus; after atropinization, breath-holding produced no changes from normal sinus rhythm
28	21	None	During breath-holding patient developed A-V dissociation, felt weak, but recovered; after atropinization, breath-holding produced no changes from normal sinus rhythm
29	21	None	No findings
30	26	None	Breath-holding resulted in shift in pacemaker to secondary site in atria; after atropinization, shifts could not be induced
31	20	None	Breath-holding was associated with cardiac slowing and in recovery period A-V dissociation and nodal rhythm occurred, cardiac rate dropping to 44/min.; syncope resulted; patient rested in recumbent position, was then tilted to the vertical position, resulting in progressive cardiac slowing, short period of asystole followed by nodal escape, and syncope; atropinization not followed sufficiently long for evaluation of atropine effect
32	21	None	No findings
33	21	None	Breath-holding resulted in cardiac slowing, A-V dissociation, nodal rhythm; breath-holding after hyperventilation resulted in lower nodal rhythm, A-V dissociation; after atropinization, breath-holding produced no changes from normal sinus rhythm
34	21	At ages 16 and 17, patient had episodes of syncope after long periods of reading or watching television	Breath-holding after hyperventilation resulted in shift in pacemaker to secondary atrial focus, also noted with breath-holding without hyperventilation; after atropinization, breath-holding produced no changes from normal sinus rhythm
35	21	None	At onset of base-line studies with patient first assuming position on tilt-table, there was shift in pacemaker to nodal rhythm followed by a 5-sec. period of asystole and syncope; after recovery period, breath-holding would produce A-V dissociation and nodal rhythm; near syncope occurred during recovery period after breath-holding; after atropinization, normal sinus rhythm developed and no further arrhythmias or syncope could be induced
36	22	None	1 min. after right carotid sinus massage, sinus bradycardia followed by shift in pacemaker to atrial, then nodal, focus, associated with near syncopal episode; after recovery, breath-holding alone was associated with marked cardiac slowing and near syncope; after atropinization, breath-holding produced no changes from normal sinus rhythm
37	22	None	No findings
38	23	None	After right carotid sinus massage, marked decrease in blood pressure with sinus bradycardia (rate 47/min.) and syncope
39	21	Syncope occurred while donating blood	Breath-holding resulted in cardiac slowing with shift in pacemaker to secondary atrial site; during prolonged breath-holding, there was a 2-sec. period of asystole associated with marked decrease in blood pressure and near syncope; after atropinization, breath-holding produced no changes from normal sinus rhythm
40	20	Syncope occurred following injection of procaine	Breath-holding resulted in two atrial premature contractions; breath-holding after hyperventilation resulted in A-V dissociation, nodal rhythm, and occasional atrial premature contractions; after atropinization, breath-holding produced no changes from normal sinus rhythm
41	27	Syncope induced by blowing against thumb after period of hyperventilation	Breath-holding resulted in A-V dissociation with nodal rhythm; breath-holding after hyperventilation again resulted in A-V dissociation with nodal rhythm; upon expiration, nodal tachycardia ensued associated with near syncopal episode; after atropinization, breath-holding produced no changes from normal sinus rhythm
42	22	None	Breath-holding resulted in shift in pacemaker to secondary atrial focus; after atropinization, breath-holding produced no changes from normal sinus rhythm
43	20	None	Breath-holding resulted in A-V dissociation and nodal rhythm; after atropinization, breath-holding produced no changes from normal sinus rhythm
44	20	None	Left carotid sinus massage resulted in cardiac slowing with shift in pacemaker to secondary focus, atrial rhythm, nodal beat, and asystole followed by syncope; thereafter repeated episodes of breath-holding resulted in shift of pacemaker to secondary atrial focus with atrial rhythm, A-V dissociation, and nodal rhythm; after atropinization, breath-holding produced no changes from normal sinus rhythm
45	21	None	Two minutes after right carotid sinus massage, first-degree A-V block occurred followed by second-degree A-V block, with an 8-sec. period of no ventricular response followed by syncope
46	20	Self-initiated syncope	On every occasion immediately after release of breath, patient developed A-V dissociation with block; this did not recur after administration of atropine
47	19	Syncope at age 14 while laceration was being sutured and, on another occasion, after venipuncture	At onset of base-line studies when patient first assumed position on tilt-table, A-V dissociation with nodal rhythm occurred followed by syncope; 41 sec. after right carotid sinus massage, period of asystole followed by syncope; breath-holding was not done in this person
48	21	None	Breath-holding resulted in shift of pacemaker to secondary atrial focus; 30 sec. after left carotid sinus massage, marked cardiac slowing with nodal rhythm and syncope; thereafter breath-holding produced nodal rhythm with syncope; after atropinization, breath-holding produced no changes from normal sinus rhythm
49	21	None	No findings
50	19	Syncope while running 2-mile race at 1.75-mile mark	No findings

---

* Frequent arrhythmias (e. g., A-V dissociation) were noted immediately after injection of atropine due to initial atropine effect. All maneuvers to test full atropinization were performed at 6 min. or more after intravenous administration to avoid confusion of early transitory effects of atropine with the syncope procedures.

made to identify the number with the subject's name. He was then asked to report whether he had truly had any syncopal episodes in the past and what the circumstances surrounding these were. The purpose of this was to detect, if possible, an index of the number of individuals entering a flying training program who intentionally suppressed information relative to previous syncopal episodes in order to be accepted in the program.

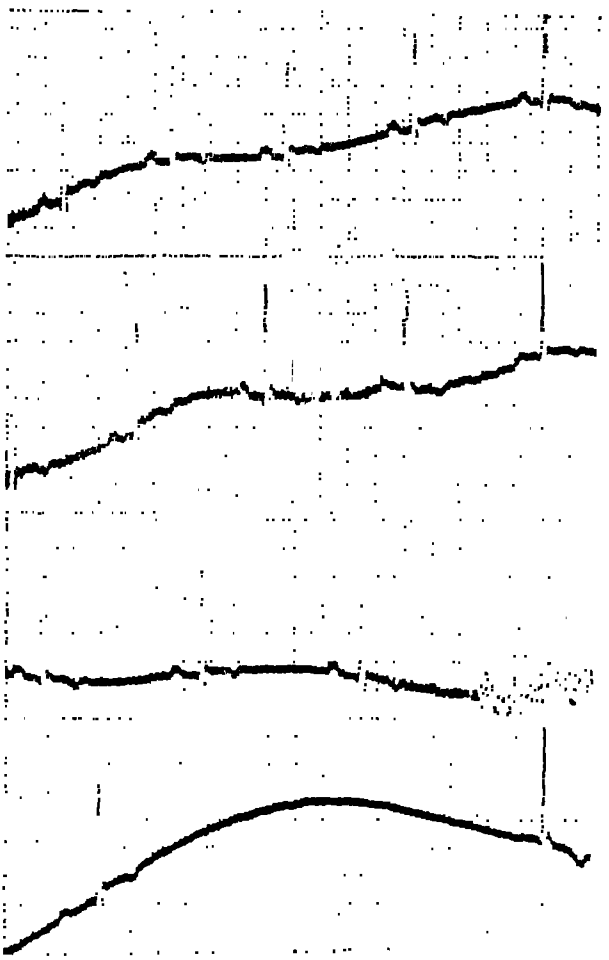


Fig. 1 (case 31).—Continuous lead 2 shows progressive slowing, with eventual sinus arrest and nodal escape. This was result of orthostatic influences.

Results

One of the most interesting facets of this study was learning the true incidence of syncope in such a group. Of the 50 aviation cadets, 15 (30%) admitted to previous undisclosed syncope.

During the experimental procedures, 21 (42%) of the subjects had one or more syncopal episodes, or near enough to syncope to stop the precipitating cause. Of the group having experimental syncope, 15 (71%) had significant cardiac arrhythmias associated with the syncopal episode. Two of the subjects having cardiac arrhythmias associated with syncope also had significant drop in blood pressure at the onset of the arrhythmia. In seven subjects, breath-holding produced syncope with arrhythmia. One subject had syncope with arrhythmia secondary to breath-holding after hyperventilation. In five subjects, carotid sinus stimulation produced arrhythmia associated with syncope. Five of the 15 subjects had syncope associated with arrhythmia due to orthostatic influences. This represented all cases of syncope due to orthostatic influences. The apparent discrepancy in numbers is due to the fact that a few subjects had syncope from more than one precipitating factor.

Syncope may occur with breathing maneuvers in the absence of apparent significant cardiac arrhythmia. There were 11 subjects (22%) in all who had syncope with breath-holding maneuvers and an additional subject who had syncope with breath-holding after hyperventilation. Often the syncopal episode occurred during the recovery phase after breath-holding. The true incidence of syncopal episodes which might be precipitated by such breathing maneuvers is slightly higher than this, as those individuals who had strong orthostatic influences were not always subjected to the remainder of the experimental protocol. This decision was made since these individuals could not be properly evaluated concerning their response to specific stimuli. In 9 of the 21 subjects, syncope could be induced with carotid sinus massage (five associated with cardiac arrhythmia and four without arrhythmia). Syncope commonly occurred after rather than during massage. In five of the subjects syncope could be induced by orthostatic influences (all five were associated with arrhythmia).

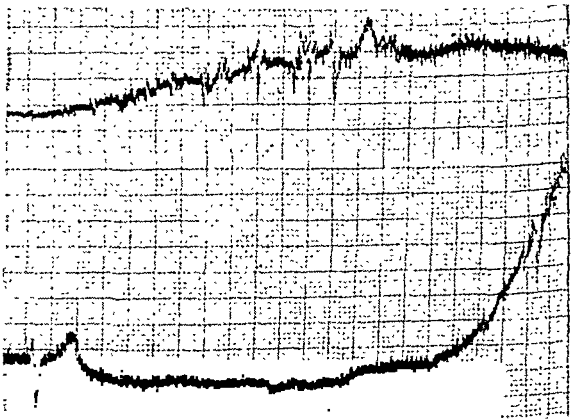


Fig. 2 (case 5).—Continuous lead 3 taken within three minutes after patient had been standing on tilt-table (upright 90 degrees). Sinus arrest with escape beats occurred and syncope followed. Artifact of muscle tremor is present. Subject was tilted to recumbent position and recovered.

Of the 15 cadets who admitted to previous syncopal episodes that had not been previously disclosed, 7 developed experimental syncope during the procedure. This, of course, means that eight other subjects who had previous clinical syncope had no syncopal episodes during the experimental procedures. Fourteen subjects who experienced syncope under experimental conditions denied any previous episode of clinical syncope.

In all the examples of syncope in this series, none were induced by breath-holding at the height of inspiration. All syncopal episodes secondary to breathing maneuvers were due to prolonged breath-holding and/or breath-holding after a period of hyperventilation. Breath-holding after hyperventilation commonly produced effects similar to prolonged breath-holding. Therefore, it is listed in a separate category only when it alone, as an additional stress mechanism, induced a syncopal episode.

Of the 50 subjects undergoing the experimental syncope procedures, 37 (74%) demonstrated some form of cardiac arrhythmia. In 22 instances, the cardiac arrhythmia occurred without subsequent syncope. More than one form of stress was capable of producing arrhythmia in a number of the individuals. In 26 subjects (52%), cardiac arrhythmia of some type could be induced by breath-holding and by breath-holding after hyperventilation. In two additional cases, cardiac arrhythmia was induced only by breath-holding after hyperventilation. Twenty-eight (56%) of the cadets had some form of cardiac arrhythmia after one of the respiratory maneuvers. Eight cadets (16%) demonstrated cardiac arrhythmias after carotid sinus massage. Five cadets (10%) developed cardiac arrhythmia associated with orthostatic stress. It is interesting to note that of the seven subjects who had a previous clinical episode of syncope as well as having syncope during he experimental routine, six had syncope secondary to breath-holding and one due to orthostatic influences.

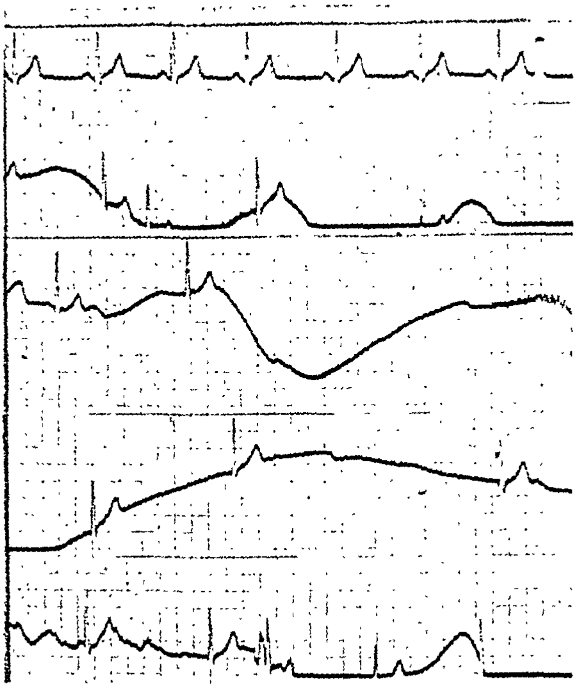


Fig. 3 (case 35).—Top strip demonstrates base-line lead 2 for patient in recumbent position. Remaining tracing is continuous lead 2 taken within three minutes after patient had been tilted to upright (90-degree) position. *Sinus arrest* with nodal escape and slow nodal rhythm is demonstrated. This occurred at onset of base-line studies to begin procedures.

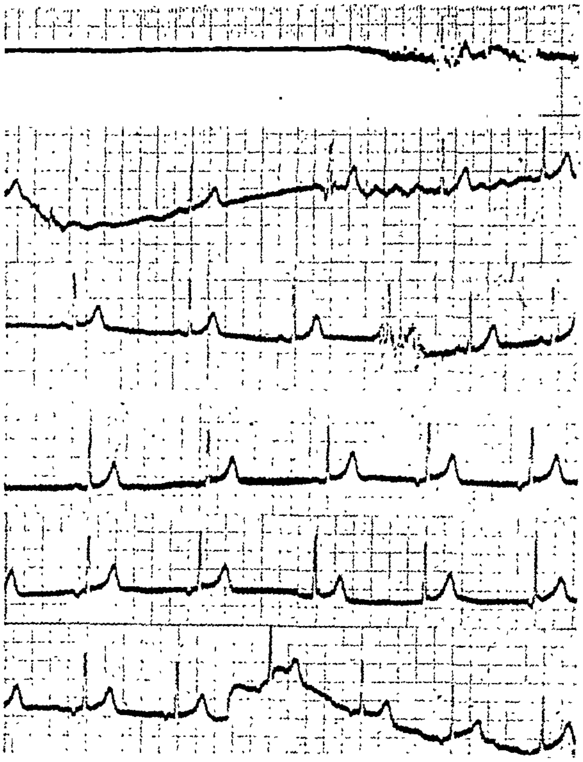


Fig. 4 (case 6).—*Above*, continuous lead 2 demonstrates period of cardiac arrest terminated by escape beats and transitory atrial flutter. This episode occurred two minutes after carotid sinus massage with patient standing (90 degrees) on tilt-table. *Below*, continuous lead 2 after tilting of patient to the horizontal position demonstrates atrial rhythm. Second strip shows atrial rhythm with A-V dissociation. Note inverted P wave just emerging before the last QRS event.

In 30 instances in which a cardiac arrhythmia was induced by respiratory maneuvers, atropine was administered. After adequate atropinization (approximately six minutes after the injection of 1/50 grain of atropine), in no instance were any cardiac arrhythmias induced by any of the respiratory maneuvers.

A very brief summary of the findings in the individual cases is presented in the table.

Comment

The incidence of syncope in this group of cadets beginning flying training suggests that the reported low incidence of syncope in cadets is entirely fictitious and represents a suppression of information by the cadet applicants in order to gain entrance into the program. If a similarly high incidence of syncope should exist in all of the individuals accepted for preflight training, it may be assumed that between 18 and 42% of all pilots beginning flying training have already experienced some form of clinical syncope. (The observed proportion of 30% is a sample estimate of the true proportion in the total population of pilots beginning flying training. As such, it is subject to sampling variation. Using a confidence interval of 2σ, it can be expected that there is only 1 chance in 20 that the true proportion having an episode of syncope lies below 18 or above 42%.) Needless to say, a large percentage of these individuals complete their flying training and carry out to completion a useful flying career.

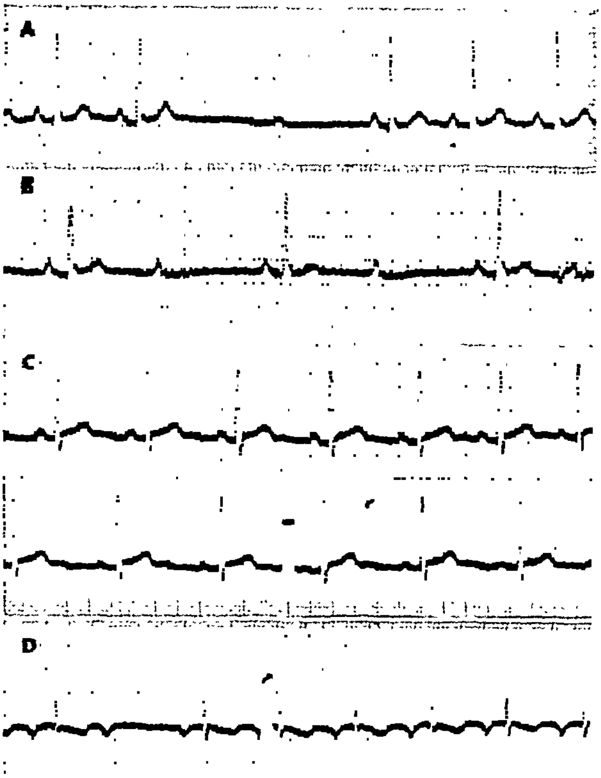


Fig. 5.—*A* (case 9), A-V block occurs just at the height of inspiration and onset of breath-holding. *B* (case 9), more persistent second-degree A-V block during prolonged breath-holding. *C* (case 10), continuous lead 2 demonstrates change in pacemaker occurring with breath-holding. *D* (case 3), lead 3 demonstrates atrial rhythm and A-V block precipitated by breath-holding after hyperventilation.

Syncope as Underlying Disease State. The relatively high incidence of syncope in a normal aviation cadet preflight group is strong argument against the concept that syncope itself presents an underlying disease state. It is difficult to assume that 30% of our highly selected, apparently healthy young men have an underlying disease process or disease complex which causes them to be subsequent hazards to flying or other crucial industrial situations.

Cardiac Arrhythmias.—In this series, it was impressive to note the high incidence of cardiac arrhythmias associated with syncopal episodes. Cardiac arrhythmias appeared to be important even in the presence of experimental orthostatic syncope. While it was previously noted [1a] that cardiac arrhythmias were important in syncope induced by respiratory maneuvers, this finding in orthostatic syncope suggests their importance in other forms of syncope as well (fig. 1, 2, and 3). Subjects 5, 17, 31, 35, and 47 demonstrated significant cardiac arrhythmia in association with their syncopal episodes.

Carotid sinus massage induced syncope, commonly presenting both cardiac arrhythmia and vasodepressor response (fig. 4). The respiratory maneuvers presented the largest number and the largest variety of cardiac arrhythmias. Passive rhythms, including atrial rhythm, A-V dissociation with nodal rhythm, and lower nodal rhythm were commonly noted (fig. 5, 6, and 7). One episode of nodal tachycardia was also observed (fig. 8).

In some instances cardiac arrhythmias were distinctly obvious as the major factor precipitating a syncopal episode. In the presence of cardiac arrest with no cardiac beat, no alternative explanation seems feasible. In those cardiac arrhythmias which resulted in marked depression of the cardiac rate, it might be assumed that the accompanying cardiac arrhythmia in the presence of other factors was sufficient to create syncope. In the event that any degree of vasodepressor syncope is present with peripheral arteriolar dilatation, progressive depression of the cardiac rate further compromises cardiac output. This in turn can be expected to lead to cerebral ischemia and present as a syncopal episode. As indicated in a previous paper,[2] the respiratory reflexes which originate from stretch receptors within the lungs stimulate the same efferent reflex pathways that are stimulated by the carotid sinus afferent nerves. Thus, one should expect both vasodepressor and cardiac arrhythmia responses when the respiratory stretch reflex is stimulated. In this series, the cardiac arrhythmias seem to be a major factor.

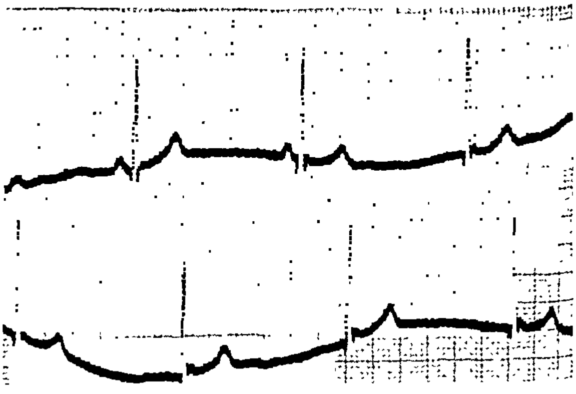


Fig. 6 (case 19).—Continuous lead 2 demonstrates onset of nodal rhythm with breath-holding.

Effect of Atropine Administration: Another interesting finding was that cardiac arrhythmias were not induced in any case by respiratory maneuvers after the administration of atropine. This strongly suggests that adequate atropinization provides a protective mechanism against developing cardiac arrhythmias by stress procedures. It follows that previous experimentation [3] which has utilized orthostatic tests with the concomitant administration of atropine has protected the experimental subject from demonstrating cardiac arrhythmias. It seems that not only may atropine act to produce syncope by creating visceral pooling but also it may prevent syncope by abolishing vagal reflexes which cause cardiac inhibition and result in cardiac arrhythmia. Impending syncopal episodes were prevented on several occasions in subjects of this series by the intravenous administration of atropine.

Changes in Electrolyte Pattern: One might ask what role shifts in electrolytes might play in the cardiac arrhythmias precipitated by respiratory maneuvers. It is pertinent to point out that cardiac arrhythmias were induced in subjects by prolonged breath-holding and also by breath-holding at the height of inspiration after hyperventilation. In the former instance with prolonged breath-holding, carbon dioxide retention should result in a tendency toward respiratory acidosis. In the latter instance, hyperventilation should tend toward respiratory alkalosis. Regardless of these two extremes in the assumed change in electrolyte pattern, cardiac arrhythmia was induced.

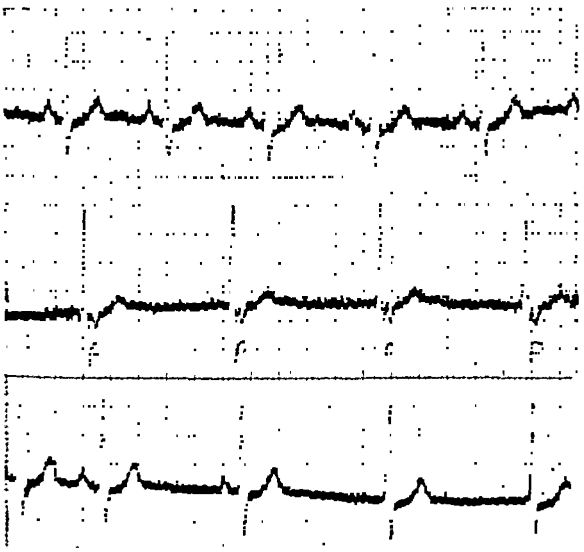


Fig. 7 (case 33).—Continuous lead 2 demonstrates lower nodal rhythm induced by breath-holding after hyperventilation.

A point of some interest in this series was the absence of syncope occurring immediately with breath-holding at the height of inspiration. Two subjects in the previous reported series of syncope patients [2] did present this finding.

Effect of Age: This particular group of subjects is not entirely comparable to those previously studied as they obviously represent a somewhat younger age group. It is well known that differences in vagotonia occur with different age groups. Marked sinus arrhythmia is more prone to occur in the younger individual. Whether this is a significant difference in the two groups studied to date is not known.

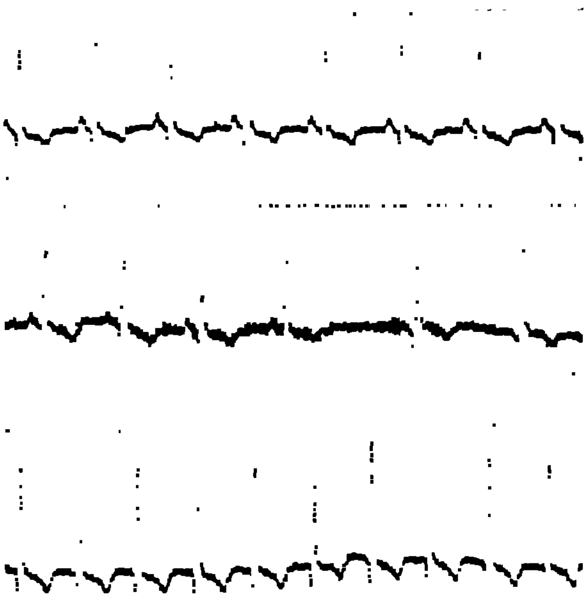


Fig. 8 (case 41).—Lead 2 demonstrates nodal rhythm and burst of nodal tachycardia induced by breath-holding after hyperventilation.

It is apparent from the study of this small group of aviation cadets that the incidence of clinical syncope in cadet applicants is considerably higher than has been previously supposed. Much needs to be done before any statement can be made concerning selection techniques to predict the future occurrence of syncope in any individual. It is highly significant that 14 individuals who presented experimental syncope by currently used procedures had apparently never experienced syncope on any other occasion. On the other hand, the experimental procedures were not able to identify the subjects who had previously experienced syncope. An individual may be syncope prone at one period of his life due to temporary circumstances (e. g., recent excessive rapid weight loss) and not be syncope prone on subsequent occasions.

Summary

Fifty young, apparently healthy aviation cadets in preflight training were evaluated in regard to syncope. Thirty per cent of these subjects admitted to previous, undisclosed syncope when they were not in fear of detection or removal from the training program. Twenty-one of the cadets experienced experimental syncope during the syncope proce-

dures. Cardiac arrhythmia was frequently associated with the syncopal episode and cardiac arrhythmia was frequently induced by respiratory maneuvers without syncope. Intravenously given atropine apparently prevented recurrence of cardiac arrhythmia induced by respiratory maneuvers. Significant cardiac arrhythmia was also noted in simple orthostatic syncope.

References

1. (*a*) Lamb, L. E.: Cardiac Function and Disease on Acute and Chronic Exposure to Altitude, G. P. **17:**88-93 (May) 1958. (*b*) Lamb, L. E.; Dermksian, G.; and Samoff, C. A.: Significant Cardiac Arrhythmias Induced by Common Respiratory Maneuvers, Am. J. Cardiology, to be published.

2. Dermksian, G., and Lamb, L. E.: Syncope in Population of Healthy Young Adults: Incidence, Mechanisms, and Significance, J. A. M. A. **168:**1200-1207 (Nov. 1) 1958.

3. Weissler, A. M., and others: Vasodepressor Syncope: Factors Influencing Cardiac Output, Circulation **15:**875-882 (June) 1957. Weissler, A. M.; Leonard, J. J.; and Warren, J. V.: Effects of Posture and Atropine on Cardiac Output, J. Clin. Invest. **36:**1656-1662 (Dec.) 1957.

EXPERIENCE WITH MEDICARE

Paul I. Robinson, M.D., New York

Wives, children, and dependent husbands of active duty personnel of the seven uniformed services have been receiving care from civilian physicians in civilian hospitals under the Medicare program. An analysis of results after 18 months of operation indicates the value of this program. Sample studies show that 41.4% of the care rendered has been obstetrical and that initiation of the program was followed by a marked drop of deliveries in uniformed services facilities and a marked increase of deliveries in the civilian facilities. A comparison of average daily patient loads showed that an average of 54% more dependents a day received medical care at government expense in 1957 (under the Medicare program) than in 1956 but that the number receiving such care in uniformed services facilities decreased by 11.6%. Additional evidence that Medicare is acceptable to uniformed personnel was obtained by questionnaire. Allegations that it had inflationary effects and influenced physicians to overcharge lack cogent proof, and it is believed, rather, that physicians themselves can control those few who charge unreasonably. The program has brought medical care to many people who apparently would not have gone to the hospitals of the uniformed services. It represents a challenge to the facilities of the uniformed services to adjust their methods of affording medical care to dependents, but it also represents a challenge to local medical associations in the areas of schedules of allowances and their utilization.

Last year at this time, it was only possible to report that the Dependents' Medical Care Program (Medicare), for wives and children and dependent husbands of active duty personnel of the uniformed services, had been placed in being. The program had been in effect barely six months. Now, dependents have been receiving care from civilian physicians in civilian hospitals for 18 months. By March, 1958, $35,957,020 had been paid to physicians and $35,154,621 to hospitals, and these amounts were reimbursed to Blue Cross, Blue Shield, state medical associations, and insurance companies who are acting as fiscal administrators under contract. These remarks are directed toward analysis of two phases of this program: (1) what it is doing for the uniformed services and (2) what it is doing for the profession of medicine.

As of March 1, 1958, physicians of all states, the District of Columbia, the territories of Hawaii and Alaska, and the Commonwealth of Puerto Rico participated in the program. Four states reported 34.8% of all physicians' claims; California, reporting 79,831 (18.2%) physicians' claims, led, and Texas followed with 35,700 (8.1%). Next were Virginia, reporting 19,876 (4.5%), and Florida, with 17,572 (4.0%). North Dakota had the fewest claims and Alaska next fewest. By geographical area, the Pacific states led with 21.9% and next came the South Atlantic states with 21.6%. The New England states had the fewest (5.5%). Sample studies in several states indicate that from 30% to 40% of registered physicians have cared for one or more patients. These same studies indicate that 77.3% of the participating physicians had been paid less than $500 each, and only 0.2% had received $10,000 or more. It is evident that the patients

---

Coordinator, Medical Relations, Metropolitan Life Insurance Company. Formerly Executive Director, Office for Dependents' Medical Care, Office of the Surgeon General, U. S. Army, Washington D. C.

Read before the Section on Military Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

are being cared for in greatest numbers in those states with the largest troop concentrations. As far as the profession is concerned, the program is a small one but it is extremely widespread in its application because personnel of the uniformed services reside in every hamlet of the United States and their dependents many times return to their homes when they are unable to accompany their sponsors. This is well illustrated by the fact that 88% of all of the dependents cared for in West Virginia were residing apart from their sponsors and 43% of all patients in the program were residing apart from their sponsors because of the exigencies of the uniformed service.

Effect on Physicians' Fees

At the inception of the program, the Office for Dependents' Medical Care depended a great deal on the experience and wisdom of the state medical associations in many aspects of the program. Notable in this regard was the determination as to whether or not the schedules of allowances would or would not be published to the physicians of the state. There was, and still is, a great difference in philosophy of state medical associations as to physicians charges. Some, our experience would indicate, believe that physicians should be entitled to a fixed fee, regardless of type of practice or state of training. These states published their schedules of allowances, and, with few exceptions, physicians charges conform therewith. Others were of the opinion that every physician should know the maximum negotiated allowance but that he should charge his usual fee. These states also published their schedules but encouraged physicians to charge their usual charges. Our experience in these areas indicates that there are a considerable number of physicians who do charge below the maximum of the schedule but by far the greater majority charge the amount published in the schedule. A third group of states feels that physicians should determine their charges in each individual case, considering all factors. They have not published their schedules but have assured their physicians that a fair and equitable amount has been negotiated and have instructed them to charge an amount equal to their ordinary charge for patients in like circumstances. Our experience in this group of states indicates that the physicians charges conform, in general, to normal civilian practice, a considerably greater number being below the modal amount and a few being higher than the schedule.

It is not considered to be within the scope of the Office for Dependents' Medical Care to express an opinion on this great problem of physicians' remuneration. We are aware of the allegations that insurance, Blue Shield, and other similar programs are having inflationary effects and influence physicians to "overcharge." Our experience does not dictate that we subscribe to this allegation. We believe that the vast majority of physicians' charges in our program are reasonable and not seriously out of line with those in civilian life. We believe that physicians themselves can control those few who charge unreasonably, and we have in our files many examples of just such actions on the part of Medicare committees within the states. The physicians of the nation have a challenge in this program in that they have a distinct opportunity to control many features of its operation.

Type of Care Rendered

Sample studies have indicated that 41.4% of the care rendered in the program is for obstetric service. While the figures are not exactly comparable because of different definitions of stillbirths used in uniformed services facilities and in some of the states in civilian life, it is appropriate that this field be discussed. In 1956 (January through August), there were 114,129 deliveries in uniformed services hospitals in the United States, Alaska, Hawaii, and Puerto Rico; in the same months for 1957, there were 82,805 births in these facilities. In civilian facilities, under the Dependents' Medical Care Program during the same period of time (1957), there were approximately 77,910 deliveries.

In other words, there had been a reduction in uniformed services facilities of 31,324 deliveries in the same period from 1956 to 1957. If the civilian program was responsible for all of this reduction, it had also taken care of 46,586 additional deliveries. It was impossible to extend this study further into 1957 and 1958 because of incomplete information in the Dependents' Medical Care Program. If this had been possible, it is likely that a still greater drop of deliveries in uniformed services facilities would have been noted and an increase in the civilian program. This is understandable. Expectant mothers desire personal attention by one physician, they like privacy, they like to discuss the type of anesthesia they will be given, and they dislike long waiting periods. They feel they have a better chance of getting all of this in the civilian program, and the uniformed services may have to make some changes in many of their installations if they desire to continue active and large obstetric services.

On the basis of an average daily patient load study made in the same comparative period (January through August, 1956-1957), while obstetric and gynecologic care given in uniformed services facilities dropped 19.7%, all other care for dependents dropped only 5.8%. It is known that there was a considerable backlog of tonsillectomies in many uniformed services clinics and that scores of these operations were accomplished in the early months of the civilian program. There has been a reduction of approximately 2% in troop strength. Certain uniformed services facilities are not staffed and equipped to accomplish all procedures of a medical nature. In view of these considerations, the drop of 5.8% in all care except that in obstetrics and gynecology may not be more than expected or desired by the uniformed services.

Choice of Government and Civilian Facilities

Since the hearings before the Appropriations Committee of the House of Representatives in April, 1957, there has been considerable discussion in the Defense Department and in civilian medical and hospital forums of the policy of permitting the patient to have "free choice" between uniformed service and civilian facilities and physicians. You are aware of the fact that the law affords an opportunity for restriction of those dependents who reside with their sponsors (approximately 57% of dependents who have participated in the program). Sincere attempts have been made to compare costs of medical care in uniformed services facilities with those in civilian communities. At this time, no valid comparison has been made. It is our opinion that much more detailed studies will have to be conducted before any conclusions can be drawn. There are many other factors which must be given thought when restrictions of "free choice" are considered.

Hospital admissions are cheaper to the dependent in uniformed service facilities, because for civilian care they must pay $25 for any period in the hospital of 14 days or less whereas in uniformed services hospitals they pay only $1.75 per day.

A small number of state medical associations sincerely feel that the Dependents' Medical Care Program should be operated on an indemnity basis. A great many more, however, are just as sincere in their beliefs that the program would not be successful if operated on an indemnity basis. The administration of the program, part indemnity and part full coverage, insofar as physicians' service is concerned would be most difficult, if not impossible. To the services this would mean that physicians in the indemnity states could charge patients additionally whereas in other states they could not. Insofar as hospitalized dependents are concerned, physicians' charges are on a full service basis. But hospital charges are on a deductible basis, as are physicians' charges for authorized outpatient care. The Medicare plan is an individual plan designed to furnish medical care specifically to dependents of uniformed services personnel. Continued efforts are being made to acquaint everyone with the plan in its proper perspective. This difference of opinion among state medical associations as to the type of program is perhaps a reflection of a continuing issue in the acceptance of voluntary health insurance. A change in the method of operation of the Dependents' Medical Care Program would probably have very little influence on the ultimate solution of the problems in the health planning field which confront physicians of the nation, the health insurance industry, and the government.

The average daily patient load of dependents in uniformed services facilities in the United States, Alaska, Hawaii, and Puerto Rico during the period of January through August, 1956, was 6,876, whereas in the same period of 1957 it was 6,075, a decrease of 11.6%. In the same period and area the average daily patient load in civilian facilities under the Dependents' Medical Care Program was 4,531. In both uniformed service and civilian facilities, an average of 10,606 dependents each day received medical care in 1957, as against 6,876 in 1956. In other words, an average of 54.2% more dependents a day received medical care at government expense in 1957 than in 1956.

Since September, 1957, 750 questionnaires have been sent to sponsors whose dependents have received care in civilian facilities under the program. In answer to a question as to why they chose to use the civilian program rather than a uniformed service facility, 43.6% said they resided too far from a uniformed service hospital; 14.9% stated that the type of care required was not available at uniformed service hospital; 13.8% preferred civilian facilities for diverse reasons; 12.8% said the uniformed service hospital was inadequate or overcrowded; 7.0% preferred the services of a particular physician or hospital; 5.0% received emergency care; and 2.9% stated the civilian facility was more convenient.

In an open section for general comments on the program, 25% gave gratuitous praise to the program, 48% had no comment, and the remaining 27% commented that they thought the program should be extended to include outpatient care, dental care, drugs, and other items or made comments on costs to them being rather high or information being difficult to find. In general, the replies to these questionnaires lead us to believe that the program has a high degree of acceptance among uniformed services personnel.

Summary and Conclusions

Evidence is available substantiating the belief that the Dependents' Medical Care Program is rendering medical care to those who could not reasonably obtain this service in hospitals of the uniformed services. In general, the program has had excellent reception by the physicians of the United States. However, it presents a distinct challenge to local medical associations in their own operational responsibilities in the areas of schedules of allowances and their utilization. It also presents a real challenge to the uniformed services medical facilities in improving care for dependent patients. The Office for Dependents' Medical Care desires to recognize the invaluable assistance which has been given to it over the past year by the surgeons general of the U. S. Army, Navy, Air Force, and Public Health Service, by the advisory committees of the American Medical Association, the American Hospital Association, and the Secretary of Defense, and by the state medical associations and their fiscal administrators, who have always been considerate and helpful in arriving at solutions to perplexing problems. The personal interest and unfailing support of the Secretary of the Army, as executive agent for the program, has been one of the great contributing factors to the success of the program during these trial months. The Office for Dependents' Medical Care will continue to try to administer the program with the interests of all the uniformed services and all the physicians and hospitals of the nation in mind in an endeavor to render medical service to dependents of the active members of the seven uniformed services in conformance with the desires of Congress.

1 Madison Ave. (10).

⁂

HEMATURIA IN BOXERS

Aaron H. Kleiman, M.D., New York

Disturbances of renal and vesical function were studied in 764 professional boxers participating in 150 events during a three-year period. A urologic history was obtained from each subject, and altogether 2,200 specimens of urine were obtained before bouts for comparison with specimens obtained after bouts. Comparisons were also possible between 132 substitutes who were prepared to box but not called upon to do so and pugilists who did box. Only 1,518 urine specimens were obtained immediately after bouts because 550 boxers were unable to urinate for several hours after the bout. Significant hematuria (6 or more red blood cells per high-power field) was found in 415 (27% of 1,518) postbout specimens of urine; 30 specimens were salmon pink, 8 were bright red, and 4 were dark red. A significant number of boxers showed consistently normal urinalyses even after four or more bouts. Roentgenographic studies revealed structural adnormalities of the kidneys in many cases of hematuria and suggested that such defects render the kidneys more susceptible to the trauma of boxing as demonstrated by the high incidence of recurrent prebout hematuria.

Significant hematuria, defined in this study as six or more red blood cells per high-power field, is generally regarded as a serious symptom for which a complete urologic investigation is indicated. Little mention is made in the literature, however, of such surveys in groups of athletes. After exercise or training, blood is commonly found in the urine of athletes engaged in all contact sports, including boxing.[1] In such men exercise may be considered as a provocative test demonstrating hematuria which may not be present at rest. Such hematuria, while usually innocent, transient, and painless, may also be indicative of prodromal states in the kidney which require careful investigation and treatment.

The present report is based on a three-year urologic study of 764 professional boxers participating in 150 events at Madison Square Garden and St. Nicholas Arena in New York. A series of investigations was conducted which demonstrated a correlation between boxing hematuria and morphologic and physiological changes in the upper urinary tract. These observations suggest that boxing hematuria is usually of traumatic and mechanical origin. It is hoped that these studies will help to supplement existing knowledge concerning the nature of renal trauma.

Methods

The investigation included (1) clinical and laboratory examinations during the day of the bout, (2) observations of boxers in the ring, (3) roentgenographic examinations of the urinary tract in 100 boxers with significant hematuria, and (4) supplemental clinical studies of boxers, other athletes, and groups of nonathletes for control observations.

Clinical Examination During Day of Bout.—The mid-day examination was conducted in the medical offices of the New York State Athletic Commission prior to the weighing-in of the pugilists. Complete physical examinations were made by Drs. Alexander Schiff, Vincent Nardiello, and Samuel Swetnick. I obtained a urologic history from each subject and collected samples of urine by the two-glass method. Urinalyses were then performed, and clinical and laboratory data were recorded. In all, 2,200 prebout urine specimens were collected.

Before his scheduled bout, I reexamined each boxer in the dressing room. Temperature, blood pressure, pulse rate, and respiration rate were noted

---

From the New York Polyclinic Medical School and Hospital.

Presented as a scientific exhibit at the 53rd Annual Meeting of the American Urological Association, New Orleans, April 28 to May 1, 1958.

for comparison with earlier and later records. From 12 to 16 pugilists were examined for each ring event, and all but a few of these actually boxed. The others were substitute boxers (emergency bouts) who remained available in case of the early knockout of a featured boxer. There were 132 such men examined.

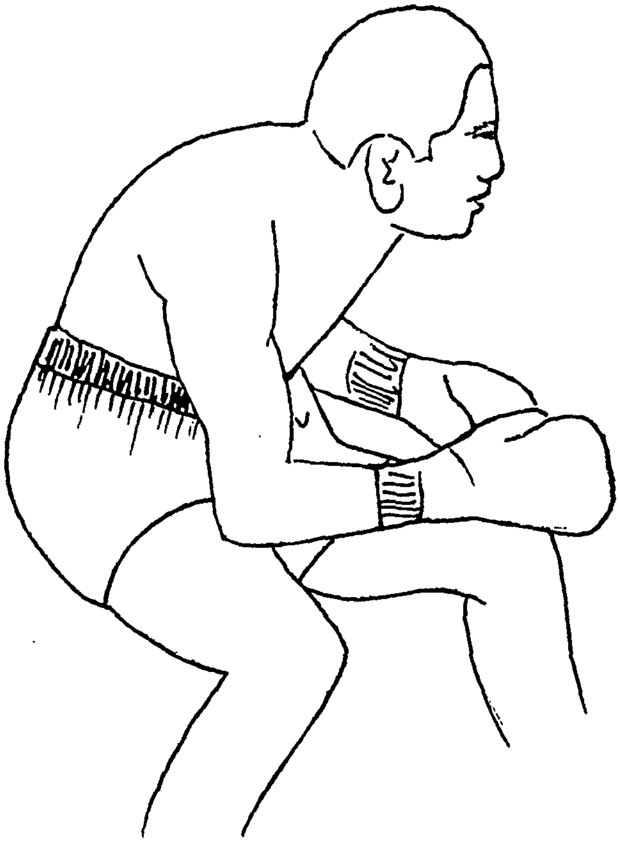


Fig. 1.—Boxer in crouch position. Repeated trauma is received in arched position. Action of diaphragm and abdominal muscles plays role in renal trauma and ptosis.

Immediately after participating in a contest, each pugilist was given a special urologic examination. Emphasis was placed on areas of tenderness over the loin or abdomen. Blood pressure, pulse rate, temperature, and respiration rate were again recorded. Whenever possible, the urine was collected by the two-glass method. Since 550 boxers were unable to void for several hours after the bout, and the 132 substitutes did not box, only 1,518 postbout urine specimens were available for analysis.

Ring Observations.—The boxing performances of most of the subjects under study were witnessed personally. Thus, evaluation of boxing styles, "kidney punches," knockdowns, and lacerations about the face and head was possible.

The typical boxer assumes a modified crouch position when facing his opponent (fig. 1). For better balance in the ring, his left foot is placed about 15 in. in front of his right and at a 90-degree angle. His extended left upper extremity is used for offensive tactics and his flexed right upper extremity for defense against blows to the face or body. At precise opportune intervals, the stronger right fist is used to deliver the most damaging blows.

During an attack, many boxers emit a loud grunt which is timed with the delivery of a punch ("grunt reflex"). This grunt is produced by combined action of the diaphragm and abdominal muscles, and it causes the diaphragm to contract against the kidney with possible renal displacement as a consequence. Both the grunt reflex and blows received directly to the abdomen in the semicrouched position are prominent etiological factors in hematuria, renal trauma, and excessive renal mobility. Such blows to the abdominal and kidney regions are far fewer than those directed to the head and face, which comprise about 85% of all blows delivered in the average contest. Many abdominal punches are blocked or slipped. Loin blows are usually received by the left kidney (fig. 2), but since these are indirect their force is attenuated. The left renal trauma is usually not as pronounced as when a blow is delivered directly to the right upper quadrant of the abdomen, with right renal injury more frequent as a consequence (fig. 3).

Roentgenographic Studies.—Intravenous urography was performed in 100 volunteers out of 415 men found to have significant boxing hematuria. The studies were made at the medical offices of the New York State Athletic Commission within three days after a bout. Findings on urinalyses were usually normal at this time.

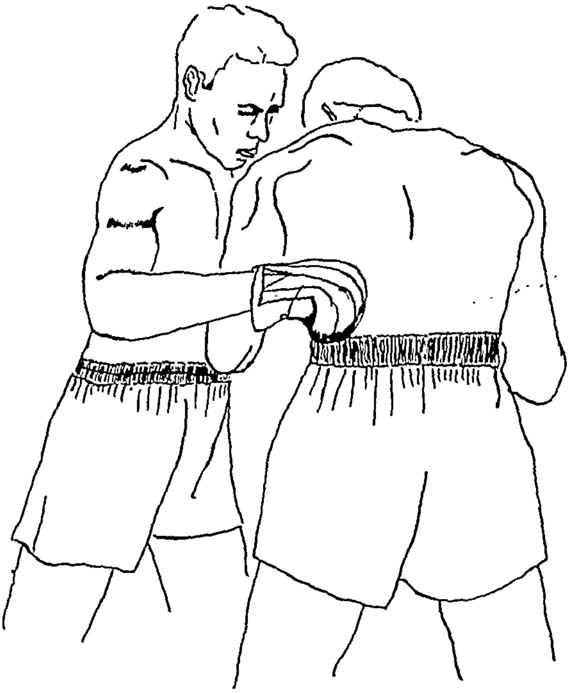


Fig. 2.—Loin blow received by left kidney. Such blows are less traumatic than direct blows to right upper abdominal quadrant.

After a preliminary scout-film study, 20 cc. of diatrizoate (Hypaque) sodium was slowly injected into a vein of the forearm. Roentgenographic exposures were made with the subject in the supine position at intervals of 5 minutes and 30 minutes. A film with the subject standing was taken within 15 minutes after injection. Excretory urography was well tolerated, with no local reactions and only five minor gastrointestinal disturbances observed. In 12 boxers cystoscopic and retrograde pyelographic studies were necessary to substantiate urographic findings. Follow-up intravenous urograms were done within three years in 74 cases.

Supplemental Investigations.—Additional studies were made to help determine whether postbout hematuria is a consequence of the activities involved in boxing or characteristic of all vigorous exercise.

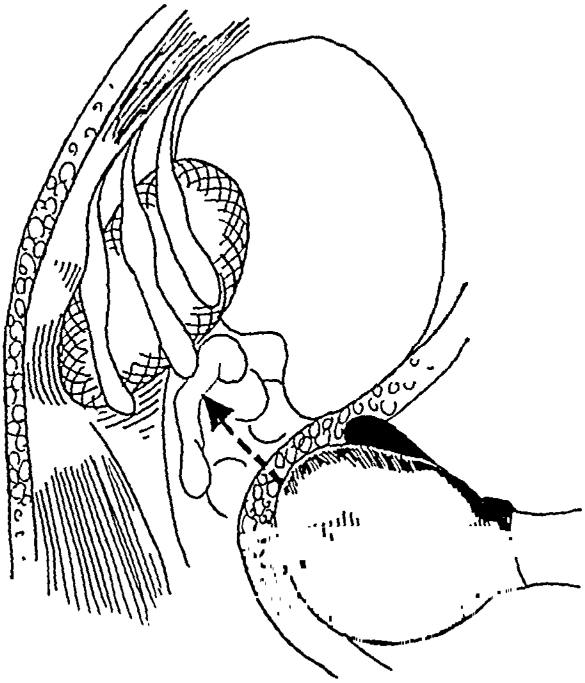


Fig. 3.—Force of direct blow to right upper abdominal quadrant shown transmitted to right kidney.

There were 132 "emergency bout" or stand-by boxers who were given standard prebout physical and laboratory examinations but who were then not called on to participate in an event. Findings in these boxers are used for comparison.

Gymnasium training for boxers consists of at least 30 minutes of strenuous exercise, including rope jumping, "shadow" boxing, and light and heavy bag punching. In order to study the effects of heavy exercise as compared with ring boxing, 100 of the boxers were chosen at random to present two-glass samples of urine immediately after such exercise. These urinary findings were charted for comparison with specimens obtained from the same subject before and after a boxing match.

A group of 20 middle-aged, retired boxers, which included 14 world champions, was carefully examined for residual urologic findings. The men had fought a minimum of 100 professional bouts during their boxing careers, with one veteran having campaigned through 527 bouts. Clinical observations included urologic history, physical examination, urinalysis, and intravenous urography. None of these men had any complaints referable to the urinary tract.

TABLE 1.—*Incidence of Hematuria in Professional Boxers*

	Preflight (2,200 Specimens)		Postflight (1,518 Specimens)	
Red blood cells/high-power field	No.	%	No.	%
1 to 5	160	7.2	571	37.6
6 to innumerable	15	0.7	415	27.4
Total	175	7.9	986	65.0
None	2,025	92.1	532	35.0

A sample of 27 men who showed consistently normal urinalyses after four or more bouts was selected for intravenous urography in order to determine whether any significant differences in morphology could be found between the men who did not bleed and those who often developed hematuria after a bout.

One hundred nonathletes, veterans of the Korean war, volunteered to participate in a study designed to filter out important factors in boxing hematuria and to determine their relative importance. Physical examination and urinalysis were performed on all the men to determine renal status. They were then divided into two groups of 50, each comprising 25 men with urinary abnormalities and 25 men with essentially negative findings on urinalysis. Each group of 50 was then subjected to strenuous jumping and bending exercises to a point of physical exhaustion for a mean exercise time of 12 minutes. In addition, the men in the second group were also subjected to 20 blows of moderate severity over the loin and abdomen. After these stresses, urinalyses and intravenous urograms were again performed on all the men.

TABLE 2.—*Incidence of Significant Postbout Hematuria According to Rounds*

	Urine Specimens,	Significant Hematuria*	
Rounds, No.	No.	No.	%
4	902	156	17
6-8	340	137	40
10 or more	276	122	44
Total	1,518	415	27 (av.)

* 6 or more red blood cells per high-power field.

Results

Clinical Observations.—Blood pressure, pulse rate, and temperature all rose substantially shortly before the pugilists entered the ring. The mean pulse rate was 84 per minute, the mean body temperature

100.4 F (38 C), and the mean rise in blood pressure 20 mm. Hg systolic and 8 mm. Hg diastolic. These changes were transient and unrelated to subsequent hematuria. A small percentage of the men also showed significant microhematuria before a bout (table 1). The emergency bout substitutes who did not box showed the same physiological elevations in the evening but had no increase in hematuria on voiding.

Table 3.—*Results of Intravenous Urography in 100 Boxers with Significant Hematuria*

	Incidence, No.	
	Right Side	Left Side
Renal Abnormality		
Excessive renal mobility	22	10
Hydronephrosis	18	9
Impaired outline of upper calyx	18	15
Impaired outline of middle calyx	8	10
Impaired outline of lower calyx	7	10
Impaired outline of all calyces	8	1
Contracted kidney	1	1
Congenital reduplication of kidney and ureter	1	1
Bifid renal pelvis	1	2
Absent kidney	1	...
Ectopic (pelvic) kidney	1	...
Total	116	59
Ureteral Abnormality		
Scar at ureteropelvic junction	11	6
Tortuous ureter	1	...
Hydroureter (congenital)	1	...
Ureterocele	1	...
Ureteritis cystica	1	1
Reduplication of ureter	2	1
Total	17	8

Laboratory Findings.—Significant hematuria (6 or more red blood cells per high-power field with or without albumin or casts) was demonstrated in 415 (27%) of the 1,518 postbout urinalyses obtained (table 1). This high incidence of hematuria reflected a tendency to recurrence in 237 of the 764 boxers participating in the study. No correlation was found between the presence of erythrocytes in the urine and the age of the boxers (range, 18 to 39 years). Boxing experience was likewise not a factor. The postbout hematuria rapidly disappeared. It was gone within 24 hours in 92% and within 48 hours in virtually all instances.

Gross hematuria was recorded 42 times: 30 specimens were salmon pink, 8 were bright red, and 4 were dark red. In eight cases postbout gross hematuria recurred. This symptom was more commonly found in the heavyweight than in the featherweight divisions and followed bouts of 10 rounds or more.

A marked racial difference was one of the most striking findings. Although the ratio of nonwhite to white boxers was approximately 2:1 (513 to 251), the incidence of significant hematuria was twice as high in the white as in the nonwhite boxers. It was found in approximately one of two white boxers, but in only one of four of the nonwhite pugilists.

More according to expectation was the finding that increased time in the ring increased the tendency toward significant hematuria: 44% of the boxers who fought 10 to 15 rounds and 40% of those who boxed 6 to 8 rounds, but only 17% of those going 4 rounds showed this finding (table 2).

Trauma was found to be the usual cause of hematura, albuminuria, or cylindruria. In serial studies of individual boxers with hematuria, abnormal elements were usually found after a difficult bout, although they were absent when body trauma had been at a minimum. In most instances, the abnormal elements were found to be coexisting; that is, albuminuria and cylindruria rarely occurred without hematuria.

Roentgenographic Findings.—The intravenous urograms revealed achitectural changes within the kidney which correlated with the frequent presence of hematuria (table 3). None of these morphologic changes, however, was sufficiently serious to require surgical intervention. The disorders most frequently diagnosed were hydronephrosis and movable kidney. In many instances, congenital renal anomalies were associated with significant hematuria aggravated by trauma.

Hydronephrosis (fig. 4) was demonstrated in 26 of 100 boxers with significant hematuria and occurred twice as frequently on the right side as on the left. Indeed, the preponderance of all lesions involved the right side, especially in the region of the upper calyces of the right kidney. In figure 5, urograms of a light-heavyweight boxer, with blood pressure of 128/78 mm. Hg, illustrate this. Excessive mobility involved the right kidney 22 times and the left kidney 10 times. In one case, that of a light-heavyweight boxer with gross postbout hematuria and a blood pressure of 128/80 mm. Hg, a second urogram disclosed a ptosed left kidney not discernible six months earlier.

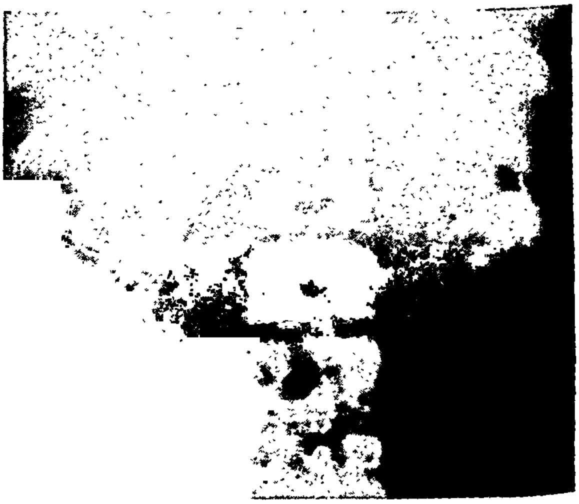


Fig. 4.—Five-minute urogram (supine position) of retired middleweight boxer who developed left renal colic during bout at 22 years of age. Note congenital bilateral hydronephrosis. Lower left major calyx is shaggy and indistinct.

A racial difference was again noted; excessive mobility occurred three times as frequently in the white as in the nonwhite boxers. The impression was gained that the perirenal fascial support is sturdier in nonwhite than in white persons, but anatomic studies are needed to substantiate this opinion.

Many of the characteristic pericalyceal deformities which are seen in urograms of both active and retired boxers are the result of a progressive process arising from repeated traumatization. The characteristic architectural deformity is the "athletic kidney." This most often involves the upper calyx of the right kidney and, to a lesser degree, the middle and lower calyces of both kidneys. In an extensive case, the entire upper calyx may be involved by distortion (fig. 6). The various types of calyceal distortion may range from scar compression with almost complete obliteration of the fornix to marked dilatation secondary to scarring at the junction of the calyx with the pelvis.

Although these urographic changes appear to be permanent, function tests with indigo carmine showed only mild impairment of renal concentration power. Fortunately, these conditions do not handicap the athlete unless accompanied by obstructing lesions. Successive urographic studies are mandatory in studying progressive deformity. They are the most accurate method employed in barring an athlete from further competitive sport.

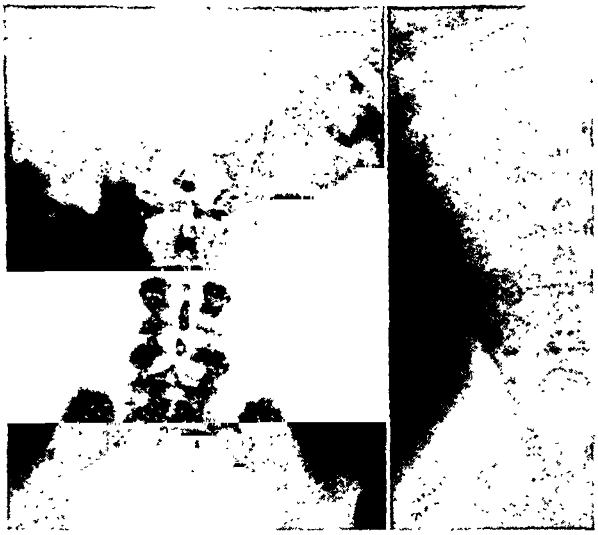


Fig. 5.—Urograms of boxer with gross hematuria after bout: *Left,* 15-minute urogram (supine position), showing dilation of right renal pelvis and upper calyx. *Right,* 15-minute urogram (upright position), showing dye trapped in upper right renal calyx.

Congenital renal anomaly (fig. 7) accounted for about one-fourth of the urinary abnormalities found. The correlation between renal anomaly, ptosis, and presence of significant hematuria was striking. I have found that these anomalous kidneys are more prone to trauma than are normal kidneys. The possible mechanism of these changes is discussed below.

A more puzzling observation was the frequent association of boxing hematuria with bleeding from other tissues. For example, 60% of the subjects who suffered postbout lacerations of the eyelid, face, or head showed significant hematuria. The possible factors producing this correlation are also discussed below.

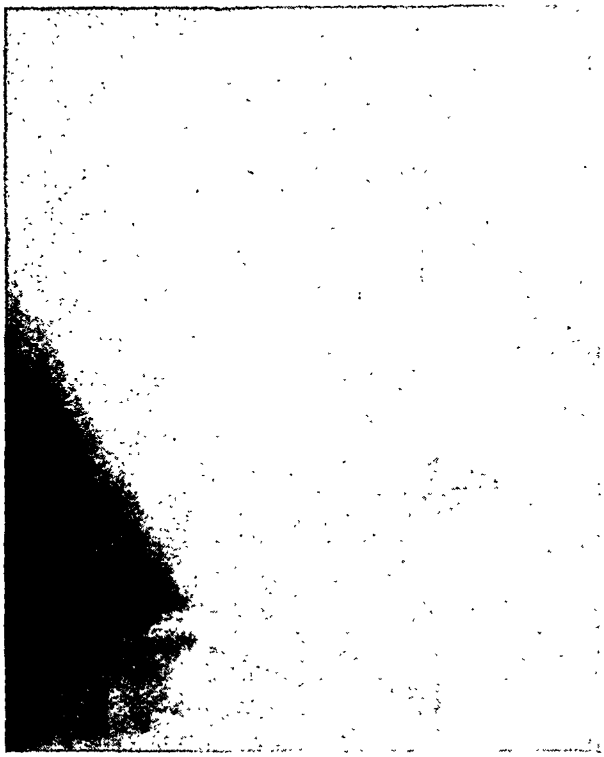


Fig. 6.—Right retrograde pyelogram, confirming irregular pericalyceal compression of stalk of superior calyx. Appearance time of indigo carmine from right kidney was eight minutes. Boxer was hospitalized because of gross, painless, postbout hematuria; he was subsequently retired.

Infections of the lower urinary tract, such as chronic cystitis, prostatitis, and posterior urethritis, were not important etiological agents in producing significant boxing hematuria. Similarly, passive congestion was of secondary importance. There were five instances of hemospermia, a condition which tends to recur in certain individuals.

Supplemental Observations.—Data for control groups confirmed the impressions obtained in the pugilists themselves that boxing hematuria is the result of the specific bodily contact and strenuous exercise characteristic of the sport, superimposed on a susceptible renal parenchyma.

Hematuria is not ordinarily elicited by the emotional stress of the competitive situation. Thus, the 132 stand-by boxers who were in readiness for competition but did not actually box had the same evening elevations in blood pressure, pulse rate, and temperature as the boxers who went into the ring. Results of urinalyses in the former group remained normal, while those in one-fourth of the over-all group indicated significant hematuria.

Similarly, exercise alone does not usually account for significant hematuria in the professional boxer. Strenuous gymnasium exercises performed by 100 professional boxers resulted in an incidence of significant hematuria of only 4%. This is in contrast to the incidence of 27% obtained in the same men after they had been in the ring.

The findings in the 100 nonathlete controls also indicate that exercise alone will not cause significant hematuria in a normal kidney. In the 25 men with completely normal urine specimens who were subjected to exercise alone, there were no instances of significant postexercise hematuria and only slight microhematuria in five. In the group of 25 nonboxers with urinary abnormalities there were 11 preexercise instances of significant hematuria. After exercise, 17 veterans showed this symptom. This increase confirms the obvious clinical impression that a preexisting pathological state greatly increases the chance that postexercise hematuria will be found.

When trauma, consisting of 20 mild to moderate blows to the loins and abdomen, was added to exercise as a provocation, the risk of hematuria in the susceptible person seemed to be slightly increased. Again, none of the 25 men with normal urine specimens before exercise and trauma showed gross hematuria after the stress procedure. But, in the group of 25 with urinary pathology, including 13 men with significant hematuria, exercise plus trauma was followed by significant hematuria in 21. A puzzling finding, however, was that the number of erythrocytes actually decreased in two subjects.

None of the 100 laymen showed the characteristic degenerative renal changes in their intravenous urograms which have been described in the professional boxers. Instead, the renal abnormalities were tumor, papillitis, pyelonephritis, essential hematuria, excessive renal mobility, and renal cyst.

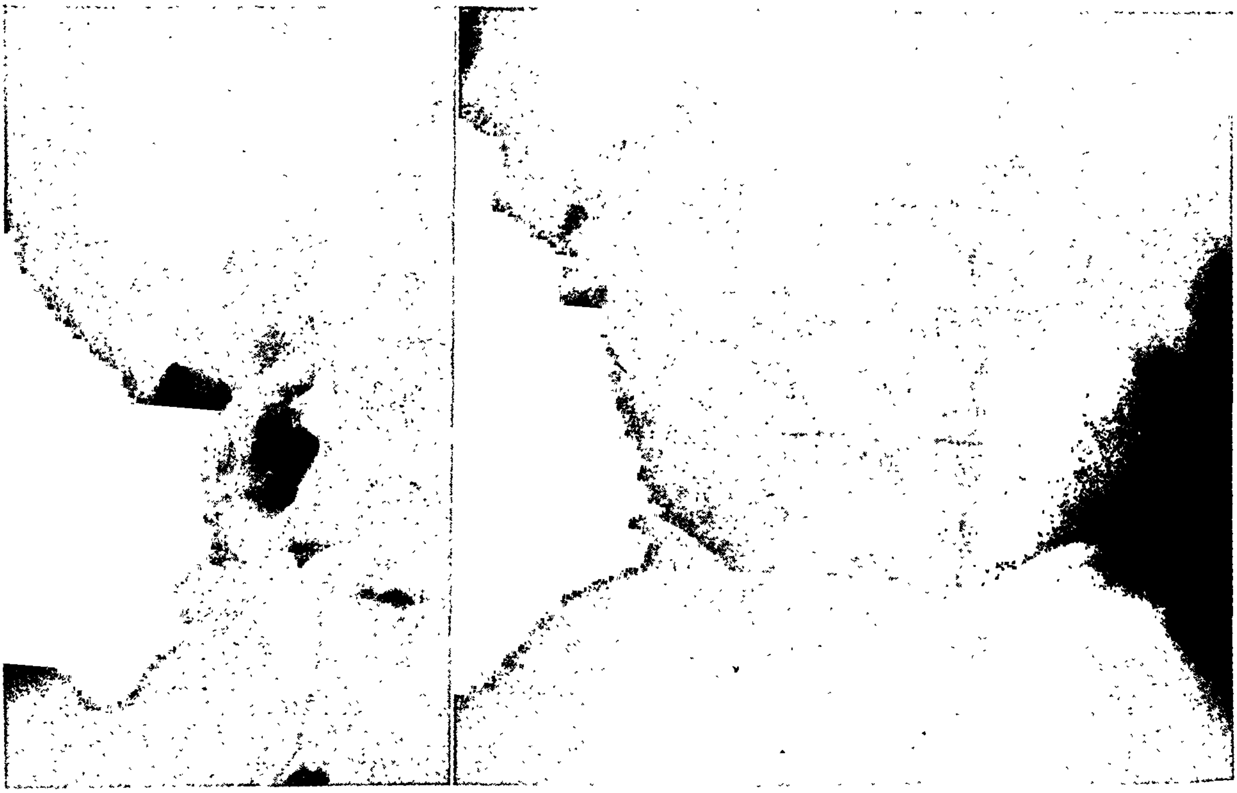


Fig. 7.—Examples of congenital renal anomaly with postbout hematuria: *Left*, urogram of featherweight boxer with congenital hydronephrosis and hydroureter on right side. Note blood clot in ureter. Athlete responded favorably to symptomatic care. *Right*, five-minute urogram (supine position) of retired heavyweight boxer, aged 23, with prebout microhematuria. Congenital absence of right kidney was confirmed by cystoscopy and aortography.

In the 27 boxers with consistently normal postfight urinalyses who were subjected to intravenous urography, fully 63% proved to have normal renal structures. In the other 37% only minimal degenerative changes of calyces or renal pelves were found, and, even in these, concentration and elimination of dye were normal.

These observations would indicate that boxing in itself does not usually produce serious renal damage. As previously mentioned, almost every instance of significant hematuria cleared within 48 hours. Observations in the 20 retired, middle-aged boxers who had fought hundreds of bouts confirm this impression. In 95% of these men, findings on urinalysis were normal. All the ex-boxers had normal pulse rates and blood pressures. Results of intravenous urograms were normal in 50% and indicated mild changes in another 30%; in only 20% were the changes considered significant. These consisted of excessive renal mobility in two cases, mild to moderate atrophy of the kidney in one, and pyelonephritis after removal of a calculus in one.

The data on the nonboxer athletes currently under study are still insufficient for formal report. Preliminary review would indicate that the findings applicable to boxing hematuria apply to a lesser degree to most other contact sports. Apparently, more cases of significant hematuria are found in football players, boxers, wrestlers, and basketball players than in hockey players.

Treatment

Trauma to the kidney should be given no less consideration in treatment than a laceration of an eyelid, for example. Boxing authorities rule that an athlete is not permitted to participate in ring activity if his eyelid shows a scar which is not sufficiently healed. Although renal tissue heals remarkably well, it seems that the required healing time of a kidney is not unlike that of the laceration of the eyelid. For this reason, a minimum rest period of 30 days is recommended for those boxers in whom significant microhematuria tends to recur. When gross hematuria occurs, a urologic investigation, including intravenous urography, is indicated. The athlete should also have successive urine rechecks, particularly after exercise. It is recommended that permission for return to ring activity be withheld until findings on urinalysis are normal. For this reason, urinalysis is performed as a standard procedure before each professional boxing match at the New York State Athletic Commission.

The physical well-being of the boxer must be considered not only for the moment but for the distant future. The physician in charge should not hesitate to bar an athlete from activity if there is any suggestion of renal pathology. Demonstration of serious renal lesions should result in the retirement of the pugilist.

Comment

Trauma to the kidney, often superimposed on congenital malformations, such as hydronephrosis, bifid kidney, and ptosis, was the most important factor in the production of boxing hematuria. It is my impression that boxing trauma may result in rupture of delicate veins within the renal papillae or pyramids.[2] The resulting hemorrhage may cause intercapillary compression about the nephrons. Later, there may be organization of a clot with proliferation of connective tissue cells.[3] The process becomes progressive if the athlete is subjected to further renal trauma without an adequate period of rest and healing. It is probable that areas of scar tissue result, thus producing the characteristic pericalyceal deformities of "athletic kidney."

As previously mentioned, this type of deformity most often involves the upper calyces of the right kidney, with the middle and lower calyces of both kidneys less frequently involved. This preference for the upper third of the kidney may result from the combined effect of repeated trauma to the flank and anterior abdominal wall, the action of the diaphragm and abdominal muscles, and the crouch position associated with the "grunt" reflex.

The frequency with which excessive mobility was found suggests that the techniques embodied in the sport of boxing may be contributing factors in this condition. The crouch position which is taken by many professional boxers in the ring predisposes to anterior displacement of the kidney. This abnormal position may tend to dislocate the kidney from its fossa, causing excessive strain on its fascial envelope (fig. 8). The "grunt" reflex employed by many boxers in delivering a blow causes the diaphragm to contract against the kidney. This is an additional factor in renal displacement. The loss of perirenal fat may be a predisposing factor to athletes in training. The superficial and deep abdominal muscles also contribute to displacement by producing reflex changes in intra-abdominal pressure. Excessive renal mobility may result in interference with venous return, producing venous stasis. The delicate distended veins in the pyramids become more easily prone to trauma. The secon-

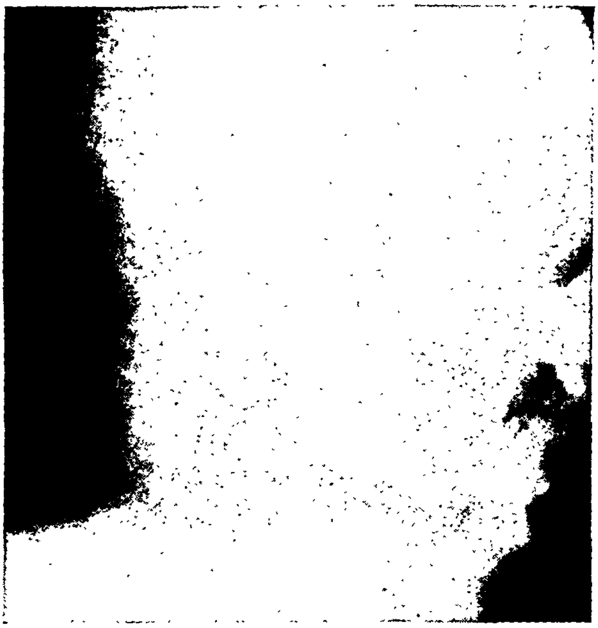


Fig. 8.—Fifteen-minute right lateral urogram of boxer in crouch position, showing anterior displacement of kidney.

darily congested nephron may develop impaired function, permitting the passage of erythrocytes and protein.

In the observation of boxers in the study, I was impressed with the fact that 60% of the subjects who suffered postbout lacerations of the eyelid, face, or head showed significant hematuria. Many seasoned veterans go through an entire career with little or no history of laceration. Other individuals "cut" easily regardless of boxing experience or the number of rounds boxed. It is possible that this correlation exists purely by chance and that a badly beaten athlete is more prone to lacerations and renal trauma. It is my theory, however, that abdominal trauma may have a direct or indirect effect on the adrenal gland or liver. As a result of trauma to these organs, a toxic, enzymatic, or hormonal product may develop within the blood stream. During the stress of activity this abnormal circulatory agent may prolong the prothrombin time or affect capillary fragility. With rest the circulatory picture rapidly returns to normal.

The data collected in this investigation may be applicable to the study of renal trauma not only in the field of sports but in accidental renal injuries as well. There is a striking degree of correlation between congenital renal anomaly, ptosis, and significant boxing hematuria. Because of inherent weakness of parenchymal vessels and fascia, the architecture of the kidney with congenital anomaly is more prone to trauma than is the normal kidney. Apparently, rupture of delicate pyramidal veins frequently results from renal trauma, initiating hematuria. Therefore, congenital anomalies of the kidney may induce a weakening of not only the supporting tissues but the more delicate vascular tissues as well. This theory should be confirmed with serial section studies of the renal tissue, a task not easy to accomplish. An appeal is therefore made to the profession in general, and to urologists and pathologists in particular, to make special serial sections of traumatic renal tissue of athletes in the operating room or on the autopsy table.

Summary

Boxing hematuria is usually an innocent, transient, and painless symptom. When it tends to recur, urologic survey is mandatory. Chronic renal trauma is the most important factor in hematuria in boxers. This condition is common in congenital anomalies and ptosis. Renal trauma does not handicap the athlete unless it is accompanied by obstructing lesions.

The incidence of boxing hematuria, renal mobility, and "athletic" kidney is higher in white than in nonwhite boxers. Further studies, including serial section of renal tissue and hematological observation, are indicated. Withdrawal from activity is paramount in the treatment of hematuria in boxers. Rest period is variable.

32 E. 64th St. (21).

Acknowledgment is made to Julius Helfand, Commissioner, Dr. Marvin A. Stevens, Chairman, Medical Advisory Board, and Dr. Ira A. McCown, Medical Director, New York State Athletic Commission, for provision of facilities.

Alice Oliveri, Thomas Menardi, Alvin Faulkner, Florence Konz, and J. Edgar Swanin provided laboratory assistance.

The diatrizoate sodium used in this study was supplied as Hypaque sodium by the Medical Research Department, Winthrop Laboratories, New York.

References

1. Amelar, R. D., and Solomon, C.: Acute Renal Trauma in Boxers, J. Urol. **72**:145-148 (Aug.) 1954. Boone, A. W.; Haltiwanger, E.; and Chambers, R. L.: Football Hematuria, J. A. M. A. **158**:1516-1517 (Aug. 27) 1955. Alyea, E. P., and Parish, H. H., Jr.: Renal Response to Exercise, J. A. M. A. **167**:807-813 (June 14) 1958.

2. Bobbitt, R. M.; Hoffman, C. A.; and Werthammer, S.: Hematuria due to Minute Changes in Renal Papillae, J. Urol. **52**:288-294 (Oct.) 1944.

3. Harrison, J. H.: Trauma to Kidney: Mechanism of Injury, Diagnosis and Management, Northwest Med. **47**:337-340 (May) 1948.

SURGICAL TREATMENT OF TRIGEMINAL NEURALGIA.—It is our opinion that the extradural, preganglionic neurotomy as originally advocated by Frazier and Spiller, and later improved by Adson, is the most effective surgical procedure for the treatment of trigeminal neuralgia. Properly performed, the operation is an anatomical one which gives relief from excruciating pain. Properly prepared psychologically before operation for the loss of sensation which must be incurred for the permanent relief of pain, the majority of patients do not suffer from paresthesias which interfere with their lives or the peace of the surgeon. Corneal ulceration occurs only after direct trauma to an insensitive cornea and is not the result of a trophic loss, independent of injury. Facial weakness and herpes labialis which occur immediately following operation are caused by excessive and unnecessary handling of the ganglion in the latter instance, and to elevation of the dura mater from the floor of the middle fossa too far posteriorly, in the first instance.—Daniel Ruge, M.D., Ruben Brochner, M.D., and Loyal Davis, M.D., A study of the Treatment of 637 Patients with Trigeminal Neuralgia, *Journal of Neurosurgery*, September, 1958.

SURPRISING GROWTH OF VOLUNTARY HEALTH INSURANCE IN GREAT BRITAIN

J. F. Follmann Jr., New York

Voluntary health insurance is being purchased by the people of Great Britain at an increasing rate. The schemes that have survived since 1948, when the National Health Service became effective, are generally independent legal entities serving groups of hospitals; the principal and most costly benefit now offered is a cash payment to the contributor, and in many cases to his wife, while hospitalized. Treatment in convalescent homes is the most widely provided benefit. In addition to these hospital contributory schemes, there are provident associations whose principal coverage is against the cost of maintenance in hospital private wards and nursing homes and toward the private fees of consultants, specialists, and surgeons. One such organization has increased the number of its contributors from 34,000 in 1949 to 283,000 in 1957. Analysis of the reasons for such growth reveals no reasons why it should not continue. Similar analysis of the health insurance mechanisms operating in the United States leads to the conclusion that a government approach on a broad population basis is neither necessary nor desirable.

It is a matter of interest to American physicians and surgeons, as well as others, to know that 10 years after the advent of the National Health Service voluntary health insurance is being purchased by the people of Great Britain at an increasing rate. Not only has the advent of the National Health Service failed to eliminate the various forms of voluntary health insurance, as had been expected generally, but the years since its inception have borne witness to an increasing need, and hence a demand, for privately puchased insurance.

Prior to 1948, when the National Health Service became effective, insurance against the costs of medical care was provided principally by nonprofit plans known as hospital contributory schemes. These organizations, which grew out of the Victorian Saturday funds, have distinct points of similarity to Blue Cross plans in the United States and, in fact, some consider them as the progenitor of Blue Cross.[1] Under these schemes, small amounts were collected weekly in return for which the breadwinner and his dependents were admitted to a voluntary hospital without having to make further payment. If admitted to a local authority hospital, the scheme made "some payment," thereby avoiding for the patient the required "means" test. Gradually supplementary benefits were added, such as ambulance conveyance, convalescent home treatment, loan of sick room equipment, dentures, and optical and surgical appliances.[1]

By 1947, there were some 450 hospital contributory schemes covering about 10 million, mostly low income, contributors and their dependents, this being about half the population of England and Wales.[1]

Protection was also made available prior to 1948 by nonprofit organizations called provident associations, their principal coverages being hospital and nursing home (private hospital) care and the costs of surgery, consultation, and specialists. Many of these associations were affiliates of the hospital contributory schemes, and consequently there were many points of similarity between the two.

The insurance companies in Great Britain, on the other hand, and unlike their counterparts in the United States, for the most part limited their coverages in respect to accidents and illnesses to loss of income, writing little in the way of hospital or medical cost insurance.[2]

The National Health Service

In 1948, the National Health Service became effective. Its purpose was to provide comprehensive medical care and services to all the people of Great Britain, the costs to be borne by funds derived from taxation. The services provided include hospital care, medical care provided by the physician—general practitioner, the specialist—or through public health agencies, dental care, ophthalmic care, and drugs and appliances. However, certain charges are made for certain forms of care or for certain medications or appliances. In subsequent years, the incidences for which these charges were made and the amounts of these charges have been increased, particularly with respect to dental care, drugs, and optical appliances. These charges, it seems, have been occasioned by a realistic endeavor to maintain the costs of the NHS within reason in relationship to the national income and the national budget and to limit abuse or excess usage. In addition, certain forms of care, such as that in nursing or convales-

---

Director of Information and Research, Health Insurance Association of America.

cent homes, are not readily provided by the scheme, and, if private hospital accommodations are chosen, no benefits at all then derive from the NHS in regard to hospital care.[3] These elements of the NHS are mentioned here because they have direct relationship to voluntary insurance in Great Britain as it has redeveloped and grown since 1948.

Hospital Contributory Schemes

Since the advent of the NHS, the insurance companies in Great Britain do not appear to have made any appreciable changes in their practices in respect to protection against the costs of medical care. The coverages written appear to be the same as those extant prior to 1948, namely, protection against loss of income. In addition to this, most of the hospital contributory schemes, which were part and parcel of the voluntary hospitals, had their assets taken over under the National Health Act and went out of existence. This action of the government paralleled the absorption of most of the voluntary hospitals under the NHS.

However, those schemes which survived were, for the most part, the larger schemes which were independent legal entities serving groups of hospitals. These determined to offer specific benefits to their contributors supplementary and ancillary to those obtainable under the National Insurance and Health Service acts. Two main approaches were taken. Some schemes preferred to tie the benefits closely to the hospital service. Others regarded extra hospital benefits, such as assistance toward the cost of dentures, spectacles, and surgical appliances as important objectives, these being some of the services for which charges were made under the NHS.[1]

The principal and most costly benefit now offered is a cash payment to the contributor, and in many cases his wife, while hospitalized. The purpose of this benefit is to help make good the loss of wages of the breadwinner resulting from being hospitalized and the added expenses when the wife is hospitalized. Convalescent home treatment is, however, the most widely provided benefit. Seven of the schemes own convalescent homes, 27 such homes being so owned. The other schemes contract with private convalescent homes. Since, under the NHS, convalescent home care is provided only if a patient needs medical treatment and nursing during convalescence, the interest in this benefit provided by the contributory schemes can be understood. Two large schemes provide only convalescent home benefits.[1]

The charges under the NHS for dentures, dental care, optical appliances, surgical appliances, and drugs have been mentioned. As these were established or increased, some of the voluntary schemes provided coverage to the extent of one-half the government charge. Full coverage of the charges is not provided, since this would result in abuse. Dental care benefits are limited to the partial cost of dentures, and no coverage is provided for general dental care. Many schemes had provided similar benefits prior to institution of the NHS.[1]

Contributions or premiums for the benefits are collected as economically as possible, usually on a payroll deduction basis, with some employers assisting in these payments. Another method used for the collection of contributions is the purchase of stamps on a weekly basis from tobacconists, chemists, and news agents. The government also permits its employees to have payroll deduction for the payment of contributions. Schemes operating in agricultural areas experience higher administrative costs, since individual collections, requiring the establishment of branch offices, are necessary.[1]

In 1953, there were more than 39 such hospital contributory schemes. Their total income in that year was over 2,225,000 pounds. In 1953, these schemes had 3,612,798 contributors and coverage included eligible dependents in addition.[4]

Provident Associations

The provident associations also managed to survive. The principal coverage provided by them today is against the cost of maintenance in hospital private wards and nursing homes and toward the cost of fees of surgeons, anesthetic services, consultants, specialists, home nursing care, therapy, and diagnostic services. This coverage is more easily understandable in the United States, since it has points of similarity to the hospital, surgical, and medical coverages written by insurance companies. The benefits are directed at the costs of the more serious illnesses rather than at those of minor ailments. There is an upper limit of indemnity under the coverage within each year. No benefits are available for treatment by general practitioners. Normal maternity care is excluded, and drugs, appliances, hearing aids, and spectacles are not paid for. There is a waiting period of three months for new individual subscribers but not for groups.[5] Outpatient services are subject to certain limitations as to amounts payable, and certain types of illnesses are excluded, such as normal dental treatment, mental disease, and chronic illness. All covered care must be on recommendation of the family doctor.[5]

The provident associations are reported to cater to those members of the public who want to make mutual provision for the high cost of maintenance in hospital private wards and nursing homes and for the private fees of consultants, specialists, and surgeons.[6]

The exact extent of this growth of voluntary health insurance in Great Britain is not known. One recent estimate, however, places the number at 4 million contributors who, with their dependents, are estimated to constitute one-quarter of the population of England and Wales.[1] While this estimate is by no means as great as the extent of voluntary coverage prior to 1948, being about one-half, it is nonetheless remarkable in the face of the National Health Service.

Of more significance is the rate of growth of this coverage in recent years. Enrollment in the British United Provident Association alone has increased from 34,000 contributors in 1949 to over 300,000 today.[6] Since the BUPA is the most prominent writer of coverage in Britain, this growth rate is significant. To these figures, of course, must be added the dependents of the contributors, the total, therefore, being about double the figures shown here. It is particularly to be noted that this rate of growth for the BUPA has accelerated most particularly in the past few years, as is exemplified in the table.

Over one-half of the present enrollment is now on a group basis.

Reasons for Growth of Voluntary Coverage

Several reasons are attributed to this growth of voluntary coverage. One, as has been stated, is the element of charges and the means or needs tests under certain aspects of the National Health Service. Another is the desire of a patient for privacy when ill. Still another arises out of the fact that some persons cannot afford to wait for beds in the government general wards, these waits being, apparently, a real problem of some magnitude. For example, at the end of 1956, 431,000 persons were reported to comprise the waiting list for hospital beds. The length of the waiting period varied by type of hospital and nature of illness. Hence, for general surgical cases the wait varied from 53 days in nonteaching hospitals to 70 days in the provincial teaching hospitals. For patients with ear, nose, and throat diseases, the wait ranged from 87.6 days in the London teaching hospitals to 135 days in nonteaching hospitals. A still further reason is assistance in affording private specialist treatment; there seems to be a desire for freedom of choice in the selection of surgeons, specialists, and consultants.

Not too much seems to be known about the kind of persons who are purchasing the protection. Contributors to the provident associations appear to be mainly of the middle class. Whether this is true of the contributory schemes is not known, since these contributors pay their premiums on a weekly basis and, hence, might have direct similarity to industrial or weekly premium policyholders in the United States. One opinion expressed to me was that an element of snob appeal is present in this growth of voluntary coverage. It is questionable, however, that this factor alone, or even mainly, could account for the appreciable growth of coverage since the NHS was started.

While the reasons for the growth of voluntary insurance stated here are in the realm of impression or speculation, they find substantiation in a seven-month study made in 1956 by Paul F. Gemmill, professor of economics at the University of Pennsylvania. As part of his study, Dr. Gemmill conducted a questionnaire survey of a segment of the British public and the medical profession. One question asked was this: "Do you now have, in addition to the National Health Service and National Insurance, membership in any societies or insurance schemes which, in case of illness, would pay part or all of your hospital or doctor's bills? If so, why do you feel that you need such additional 'protection' since NHS promises to provide for all health needs?" The response to this question showed that 29.8% of those questioned had such additional protection. The reasons for having the additional protection varied, but, in general, they were as follows: "extra illness cash," "subscription small and worth paying," "for private room," "for emergencies," "for extras," "for semi-luxuries," "for home help," "for private ward," "for convalescent home," "for added comforts," and "was previously a member" (this one was often repeated).[7] Certain differences in these responses might be accounted for by the differing types of coverages made available.

Rate of Growth of British United Provident Association

	Contributors, No.	Net Increase, No.
1949	34,000	...
1950	35,000	1,000
1951	44,000	9,000
1952	69,000	25,000
1953	105,000	36,000
1954	162,000	57,000
1955	214,000	52,000
1956	252,000	38,000*
1957	283,000	31,000

* Decrease in rate of growth in 1956 resulted from imposition of upper age limit of 65 on new enrollees.

Trends for the Future

There appears nothing in the picture of the foreseeable future which would indicate other than that this growth of voluntary insurance will continue. This growth might, in fact, be reasonably expected to accelerate, provided the economy remains stable. Obviously, certain changes in the nature or extent of the services provided by the NHS could affect this either way, but these do not appear to be in the offing.

There are two developments, however, which should be mentioned, since they could have marked effect on the future. One of these is a study to be made by the British Medical Association. Dr. J. Leslie McCallum, a member of the Council of the British Medical Association, has described the situation thus[8]:

> There is still a good deal of private practice and . . . there is a good deal of room for insurance-assisted private practice in the United Kingdom. . . . The British Medical Associations have decided to set up a committee of their own to investigate the workings of the National Health Service. . . . Should such a committee conclude that insurance should play a bigger part than it does now in the public service and the government accept its findings, then the situation would

> be vastly different, both for the public economy of Great Britain and for the insurance world and, of course, the doctors.
>
> For private hospital facilities there are already three or four companies who are catering for a real need for a small annual premium, and several of us on our side are drawing up schemes for grants-in-aid on insurance principles to help keep alive private practice. . . . Some of us will go on investigating such schemes as contracting out of Government National Insurance and insurance plus government cover for sickness, on the lines of the Australian scheme, with suitable tax reliefs for premiums, because we feel that there must be an alternative to govern-controlled Medicine.

The other development to which reference has been made is an outgrowth of a movement called Fellowship for Freedom in Medicine. This movement, which has no ties to the British Medical Association, appears to have as its general purpose the promotion of the private practice of medicine and the development of a scheme as an alternative to that of the NHS. Such a scheme would be based on "real insurance principles under which doctors and hospitals will charge fees for services rendered, and the bulk of these fees will be covered by insurance supported by a state subsidy; the state's contribution will be less than 50% of the charges incurred; those who cannot afford to pay insurance premiums will not be required to do so; the state will bear full responsibility for them and their dependents; and provision will also be made for reducing the heavy cost to the taxpayers of drugs and appliances."[9]

Among the purposes of the proposed scheme are that of putting more responsibility for his health on the patient, of giving him a greater influence on the quality of the services he receives, and of restoring the principles of private practice for all insured patients.[9]

It is noted that the functioning of this proposed scheme is restricted to "non-profit-making" organizations. This, presumably, would eliminate from the picture the insurance companies. The fact that no objection appears to be registered on this score is probably due to the fact, as has been noted, that the insurance companies in Great Britain have not been active in writing insurance against the costs of medical care.

In addition to these two developments, a further factor has begun to manifest itself which is of direct interest here. As voluntary health insurance has expanded, so has the demand for private hospital accommodations. However, there has been virtually no increase in the number of private beds in hospitals available to satisfy this demand, and from time to time existing private nursing homes (private hospitals) are finding themselves forced to close down entirely for financial reasons. Such a development, naturally, could eventually serve to retard the further growth of voluntary insurance somewhat unless corrected. Accordingly, the BUPA is sponsoring the financing of the Nursing Homes Charitable Trust, the object of which is to maintain and increase the number of existing private accommodations.

Comparison of Trends in Great Britain and the United States

One is impelled to strike comparison between the situation in Great Britain prior to 1948 and that in the United States in 1958. Despite obvious differences in the economy, the effects produced by two long wars, and certain differences in traditions and outlook, there appear to be certain other variances worthy of note.

One of these is what appears to have been the marked reticence of the well-established insurance companies in Great Britain to write coverages which would serve to spread the costs of medical care. This reticence had its counterpart in the United States until about two decades ago but by no means can be considered as existing today. To the contrary, the majority of Americans having voluntary health insurance protection today are covered by the insurance companies.

Another is the failure of the insuring mechanisms in Britain prior to the inception of the NHS to protect more than half of the population. Here it is recognized that in 1948 less than half of the United States population had some known protection. In the intervening years, however, this coverage has grown to about 70% in the United States and is still growing.

A third factor, somewhat related to the preceding one, was the apparent hesitancy on the part of the British mechanisms to use the group approaches on a large scale in writing their coverages. This approach is largely accountable for the rapid growth of coverage in the United States and, in fact, seems accountable for a good bit of the recent growth in the United Kingdom now that it is being advanced on a broader scale. Here, of course, the attitude of employers and labor unions plays an important role.

A final point appears to be in the quality of the insurance benefits made available. For the most part, the benefits offered in Great Britain prior to the advent of the NHS appear to have been small in amount and limited in scope, pitiably so in some cases. While they certainly offered some protection, they do not seem to have even reasonably approached offering real assistance in cases of serious illness. In the United States today, on the other hand, appreciable assistance is rendered by all types of mechanisms, particularly since the innovation and advancement of the insurance companies of major and comprehensive medical expense coverages. While the actual degree of coverage in the United States can be disputed because it is not clearly known, and while the optimum protection as a desideratum is unresolved in a maze of varying philosophies, it would seem a truism that voluntary health insurance protection in the United States today is on much firmer ground than was the case in Great Britain prior to functioning of the NHS. It is believed that this fact is often too little understood.

When one considers that health insurance in the United States is still growing rapidly, that many differing means are being employed, and that it is vital with experimentation and evolutionary development, the respective situations—the United Kingdom in 1948 and the United States in 1958—do not appear to be at all comparable. The remarkable response of the various types of health insurance mechanisms in the United States to the marked changes which have occurred in the field of medical economics would seem to stand as a clear indication that a government approach on a broad population basis is neither necessary nor desirable.

750 Third Ave. (17).

References

1. Dodd, J.: "Not by Bread Alone": Blue Cross Idea Under British National Health Service After 10 Years, Hosp. Management **84**:57-58, 89 (Dec.) 1957.
2. Dinedale, W. A.: History of Accident Insurance in Great Britain, 1954.
3. Report of Committee on Enquiry into Cost of National Health Service, Parliament, 1956.
4. Dodd, J.: Supplementing Insurance, British Hospitals Contributory Schemes Association.
5. Tyndel, M.: Private Health Insurance in U.K., editorial, Canad. M.A.J. **76**:888-889 (May 15) 1957.
6. Ninth Annual Report, British United Provident Association, June 30, 1956.
7. Gemmill, P. F.: Address read before the International Insurance Conference, University of Pennsylvania, May 22, 1957.
8. McCallum, J. L.: Address read before the International Insurance Conference, University of Pennsylvania, May 22, 1957.
9. Towards Reformed Health Service: Outline of New Plan for Subsidised Personal Insurance, London, Fellowship for Freedom in Medicine, July, 1957.

CLINICAL NOTES

EFFECT OF PREDNISONE IN THE TREATMENT OF MALIGNANT EFFUSIONS

Jorge Franco, M.D., Byron E. Hall, M.D.
and
Donald R. Hales, M.D., San Francisco

About 30% of the patients with metastatic malignancy develop significant effusions in the pleural, peritoneal, or pericardial cavities.[1] Rarely, the fluid has the characteristics of a transudate, as in some cases of mediastinal adenopathy, or a high content of fats, as in chylous effusions. More commonly, its physical properties resemble those of an exudate, with a specific gravity in the neighborhood of 1.016, a protein content higher than 3.5 Gm.%, and a high number of cells in the sediment. It was for the latter type of exudative effusions that the intracavitary administration of radioisotopes and alkylating agents was proposed; it was presumed that the effectiveness of this form of therapy was due to high local concentration of the cancerocidal agent coming into direct contact with the malignant tumor implants on the serosa surfaces.[2]

In general, it is estimated that with either radioisotopes or chemotherapeutic agents it is possible to achieve control of the effusions in about 60% of the cases; this therapy is contraindicated in patients with severe bone marrow depression and in those with loculated effusions with multiple adhesions.[3]

Since it has been shown that corticosteroids will inhibit tuberculosus effusions[4] and experimentally induced ascites,[5] it was felt that the steroids might delay the reaccumulation of fluid in malignant effusions, should an inflammatory component be present.

Material and Methods

Dosages comparable to those used for tuberculous exudates (30 mg. of prednisone per day in three divided doses) were given to 26 patients with pleural effusions (17 cases) or ascites (11 cases) secondary to carcinoma of the ovary, breast, and lung, lymphosarcoma, osteosarcoma, melanoma, adenocarcinoma of the gallbladder, Hodgkin's disease, and fibrosarcoma (neurofibrosarcoma). In all the patients the fluid had characteristics resembling those of an exudate. Malignant cells were found in the fluid of 24 patients. After what was considered the maximum effect was obtained (generally in about four weeks), the dose of prednisone was gradually decreased to reach a smaller maintenance dose, which usually was around 15 mg. a day.

Comparison of the total volume of fluid removed and number of aspirations performed over comparable periods of time, before and during steroid

---

From the Department of Medicine, Stanford University School of Medicine.

therapy, were the criteria used to determine the effect of therapy. The results were considered (1) good when there was no need for additional paracentesis; (2) fair when the need for paracentesis and the volume of fluid removed were decreased by more than 50%; (3) undetermined when the patient died during the first month of therapy; and (4) failure.

Results

In favorable cases, the clinical improvement was evident within three to five days. Roentgenologic evidence of improvement occurred within the first three weeks.

In 14 of the 26 patients, it was possible to control the reaccumulation of fluid during the administration of prednisone for periods of up to 11 months. These results are expressed in relation to the type of neoplasia and the site of effusion in the table. Rapid reaccumulation of fluid occurred in two patients on sudden discontinuation of steroid therapy. One of them responded to a second course of prednisone therapy; the other died before treatment could be evaluated. No evidence of tumor regression was observed in these patients.

Results of Prednisone Treatment in Malignant Effusions in Relation to Tumor Type and Localization of Effusion

	Results				
	Good	Fair	Undetermined	Failure	Totals
Primary Tumor					
Breast	4	1	4	...	9
Ovarian	3	...	1	...	4
Lymphosarcoma	4	...	...	2	6
Other	3	3	...	1	7
Total	14	4	5	3	26
Effusion*					
Pleural	9	3	2	3	17
Peritoneal	7	1	3	...	11

* Two of 26 patients had ascites and pleural effusion simultaneously.

Complications.—In one patient there occurred a reactivation of pyelitis, due to Escherichia coli, which was responsive to therapy with chloramphenicol. Oral moniliasis occurred in two other patients. Two patients who had histories of peptic ulcer showed no evidence of reactivation of the ulcer while receiving steroid therapy. However, they were maintained on ulcer diets and given aluminum gel prophylactically. Moderate sodium restriction and intermittent use of oral diuretics were necessary in one patient to control sudden weight gains of up to 6 lb. (2.7 kg.).

Comment

In this limited series of patients with malignant effusions, the response to prednisone therapy did not appear to depend on known sensitivity of the tumor to cortisone therapy, such as has been reported in breast carcinoma and lymphosarcoma. This, plus the lack of tumor regression, suggests that the effect was not due to direct tumor suppression. Patients in terminal condition frequently experienced varying degrees of relief of dyspnea and improvement in their general condition.

At present, it seems that the results of steroid therapy in neoplastic effusions do not depend exclusively on anti-inflammatory action. Recently, Fraisse and co-workers,[6] Riemer,[7] and Fabre[8] have independently reported favorable results with prednisone in the treatment of cirrhotic ascites and cardiac edema, conditions in which no inflammatory factor has been demonstrated. Similar effects in apparently such different situations (tuberculous effusion, malignant effusions, cirrhotic ascites, and cardiac edema) could well be related to adrenal inhibition with decrease in the utilization of aldosterone. This, however, does not seem to be the only factor, because we have followed some patients with breast carcinoma who developed proved malignant effusions several months after bilateral adrenalectomy.

The action of the steroids is probably the result of multiple mechanisms: neutralization of exudate at the site of the inflammatory response[9]; decrease in capillary permeability; changes in the electrolyte and protein balance; improvement of hematopoiesis; and possibly other factors about which little is known at present.

Summary

The most common type of neoplastic effusion occurs as a result of tumor implantation on the serosa membranes; it usually has the characteristics of an exudate; and it can be effectively controlled in about 60% of cases by means of the intracavitary administration of cancerocidal agents (radioactive isotopes and alkylating agents).

An attempt to modify the inflammatory reaction of the serosa membranes was made by means of the administration of prednisone. Twenty-six patients with neoplastic effusions were treated for periods of 1 to 11 months. The initial dose of prednisone was 30 mg. a day. After the first month it was gradually reduced to reach the smallest maintenance dose possible. Effective and rapid control of fluid was attained in 9 of 17 patients with pleural effusions, and in 7 of 11 patients with ascites.

Stanford University School of Medicine, Clay and Webster streets (15) (Dr. Hall).

This study was supported by a grant from the National Cancer Institute, National Institutes of Health, U. S. Public Health Service.

References

1. Clarke, T. H.: Radioactive Colloidal Gold Au ^{198} in Treatment of Neoplastic Effusions, Quart. Bull. Northwestern Univ. M. School **26:**98-104, 1952.

2. Müller, J. H.: Zur medizinisch-therapeutischen Verwendung der künstlichen Radioaktivität, Bull. schweiz. Akad. med. Wissensch. **5:**484-510, 1949. Weisberger, A. S.; Levine, B.; and Storaasli, J. P.: Use of Nitrogen Mustard in Treatment of Serous Effusions of Neoplastic Origin, J. A. M. A. **159:**1704-1707 (Dec. 31) 1955.

3. Chang, C. H.; Janzen, A. H.; Skorneck, A. B.; and Rosenbaum, P. J.: Treatment of Malignant Effusions by Intracavitary Injection of Radioactive Colloidal Gold, Am. J. Roentgenol. **77**:486-492 (March) 1957.

4. Even, R., and Sors, C.: Indications et résultats du traitement des tuberculoses des séreuses et de certaines tuberculoses pulmonaires par l'ACTH associé aux antibiotiques, Semaine hôp. Paris **30**:2852-2859 (July 26-30) 1954.

5. Franco, J., and Hales, D. R.: Anti-inflammatory Substances in Malignant Effusions, Clin. Res. **6**:61 (Jan.) 1958. Goldie, H.; Walker, M.; Jones, A. M.; and Ross, D. E.: Inhibition of Serous Exudation and Tumor Cell Proliferation in Peritoneal Cavities of Mice Given Cortisone, Proc. Soc. Exper. Biol. & Med. **85**:578-581 (April) 1954.

6. Fraisse; Plan; and Brondell: Action de la delta-cortisone dans les cirrhoses éthyliques avec ascite, Arch. mal. app. digest. **46**:535-554 (June) 1957.

7. Riemer, A. D.: Effect of Prednisone in Treatment of Refractory Cardiac Edema, Bull. Johns Hopkins Hosp. **98**:445-453 (June) 1956.

8. Fabre, J.: Le traitement des œdèmes, Helvet. med. Acta **23**:381-413 (Nov.) 1956.

9. Menkin, V.: Direct Effect of Corticotropin (ACTH) on Capillary Permeability in Inflammation, Am. J. Physiol. **189**:98-104 (April) 1957.

UNIQUE MOVABLE FOOTREST FOR ELEVATION OF THE LOWER EXTREMITY

J. DeWitt Fox, M.D., Detroit

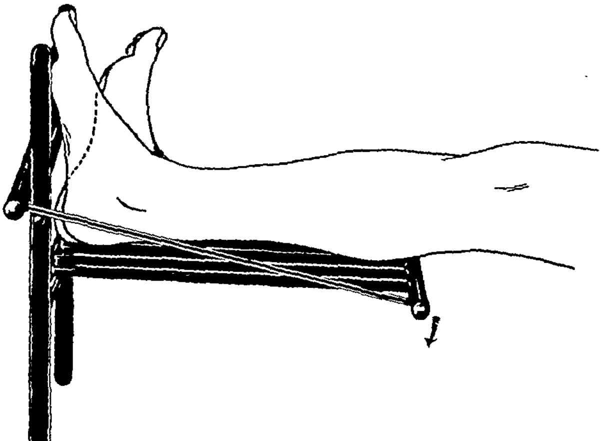
The danger of prolonged sitting without elevation of the lower extremities or movement of the legs has been stressed as a cause of venous and arterial thrombosis of the leg vessels. Homans[1] emphasized the frequency of thrombosis of the deep leg veins as a result of prolonged sitting, especially in automobiles. Tall men are peculiarly susceptible to venous thrombosis after long motor trips.[2] During World War II, Simpson[3] noted 21 sudden deaths from pulmonary embolism in persons in or leaving air-raid shelters. The cause was noted to be venous thrombosis of the legs, resulting from long periods of sitting on chairs or benches with the edges compressing the veins.

An additional modern hazard has been added to the sedentary American—prolonged television viewing, which favors venous stasis. Naide[4] has pointed out that prolonged television viewing may cause venous and arterial thrombosis in the legs and reports three cases in point.

The need for a device to prevent such occurrence prompted me to investigate various types of footrests. The one presented here is unique in design, in that it offers relaxation yet favors gentle motion of the lower extremities. One disadvantage of the ordinary footstool or hassock is compression of the calf veins. In persons with poor venous circulation, prolonged sitting without elevation of the leg or with the calves compressed against a hassock may predispose to venous thrombosis.

The need for the prevention of venous stasis while sitting is vital not only to healthy individuals with normal circulation but also to patients with a wide variety of lower-extremity maladies that require elevation of the limb. These may range from fractures of the bones of the foot, ankle, or leg to gout.

Not long ago, I had occasion to visit a friend who had thrombophlebitis. I found him sitting in the living room watching television with his affected leg elevated on a unique footrest. This device favored frequent movement of his toes and feet and prevented pressure on the calf while encouraging good venous return by the milking action of the calf muscles on his veins. The device was so lightweight, simple, and readily available that it is reported here as a valuable aid to patients requiring leg elevation or persons in good health who do prolonged standing and need a better venous return at the end of the day.



Movable footrest which tilts to the position preferred. Note that it does not hook to chair or compress calf.

The device is a portable folding footrest (see figure) that would be valuable to anyone needing elevation of the lower limb and a comfort to the person viewing television. It helps prevent venous stasis and thrombosis, since its construction favors movement of the foot and leg. It can be rocked back and forth readily while the toes of the feet are dorsiflexed and plantar flexed, thus milking the calf veins frequently and keeping quite active the circulation of the blood in the lower extremities. It does not compress the calf or popliteal area.

The rest may be moved readily. It fits any chair height or length of leg. Because it is portable it can readily be folded and carried to the office, ballgame, or picnic. This adaptability encourages the patient having a need for elevation of the leg to keep active and enjoy life to the full while caring for his leg.

If padding is desired, a pillow may be placed on the footrest for comfort. The rest is so light and is set at such an angle that it favors relaxation, yet moderate movement of the feet, in contrast to the conventional footstool or hassock, which are stationary.

Some of the conditions in which such a footrest would be of value in treatment are as follows: thrombophlebitis, phlebothrombosis (after hospitalization), varicose veins, stasis ulcer, fracture of the leg bones, ankle, and foot, cardiac or renal dependent edema, lymphangitis, contusions or injuries to lower extremities or feet, diabetic ulcer of the foot, arthritis, and after lower-extremity surgery (i. e., bunionectomy).

Prophylactically, the footrest would be appreciated by barbers, surgeons, sales persons, or anyone on his feet all day. Because it favors gentle calf motion by dorsiflexion and plantar flexion of the feet, it favors a return of normal circulation in a person having a tendency to venous pooling in the feet during the day.

Summary

A unique folding footrest favors gentle foot motion. It is an aid in the treatment of patients needing elevation of the lower extremity. It also is a comfort to persons doing prolonged sitting or television viewing to prevent venous stasis and thrombosis.

540 N. Central Ave., Glendale 3, Calif.

The footrest reported in this study is manufactured by Hamilton O. Cornwall Co., South Paris, Maine, and distributed by Breck's, Boston.

References

1. Homans, J.: Thrombosis of Deep Leg Veins due to Prolonged Sitting, New England J. Med. **250:**148-149 (Jan. 28) 1954.

2. Naide, M.: Spontaneous Venous Thrombosis in Legs of Tall Men, J. A. M. A. **148:**1202-1203 (April 5) 1952.

3. Simpson, K.: Shelter Deaths from Pulmonary Embolism, Lancet **2:**744 (Dec. 14) 1940.

4. Naide, M.: Prolonged Television Viewing as Cause of Venous and Arterial Thrombosis in Legs, J. A. M. A. **165:** 681-682 (Oct. 12) 1957.

* * *

AN OVERWHELMING STRONGYLOIDES INFECTION

Harold W. Brown, M.D.
and
Vincent P. Perna, M.D., New York

Although infections with Strongyloides stercoralis are usually mild, they can be severe[1] and sometimes fatal.[2] The patient reported in this paper is of interest for several reasons. First, she had a massive Strongyloides infection, complicated by a terminal Escherichia coli septicemia and meningitis. Second, there was a lag of at least 36 years between the time of first infection with the parasite and the appearance of severe symptoms. Third, at autopsy, there was evidence of an overwhelming internal autoinfection.

Obviously, the disease must have been present for many years in a subclinical state. The intensification of her infection followed several abdominal operative procedures, but there must have been other less obvious factors also responsible for the development of the severe autoinfection.

It will be recalled that the life cycle of this parasite usually involves the passage of rhabditiform larvae in the stool. These mature outside the body into infective filariform larvae. Ordinarily they then penetrate the skin of another host, migrate to the lungs, and eventually reach the gastrointestinal tract, where they develop into the mature worms. In some cases, however, the rhabditiform larvae develop into filariform larvae before they leave the gastrointestinal tract. These filariform larvae may then invade the wall of the lower intestinal tract and migrate by the blood stream and lymphatics to the lungs. This is referred to as the autoinfection

---

From the College of Physicians and Surgeons, Columbia University.

or a hyperinfection phase of the life cycle. Autoinfection, as in this case, may eventually be associated with severe symptoms and death.

Report of a Case

The patient, a 58-year-old woman, was first admitted to the hospital in February, 1954, with massive gastrointestinal bleeding. She was born in Panama and moved to New York City 36 years ago. Since then she had worked as a beautician. An x-ray examination of the gastrointestinal tract indicated extensive diverticulosis without evidence of diverticulitis or other apparent cause for her bleeding. Her hemoglobin level at this time was 11.0 Gm. %, and her white blood cell count was 7,300 per cubic millimeter, with 76% neutrophils and 2% eosinophils. An exploratory celiotomy was performed. Extensive diverticulosis of the large intestine was found. A partial sigmoidectomy was done, accompanied by a transverse colostomy. Examination of the surgical specimen revealed only diverticulosis and chronic mesenteric lymphadenitis.

In April, 1954, the patient was readmitted for closure of her transverse colostomy. The hemoglobin level at this time was 12.3 Gm. %, and white blood cell count showed 8% eosinophils. In June, 1954, the patient had diarrhea for a day or two, accompanied by the passage of bright red blood. Her hemoglobin level at this time was 12.4 Gm. %. She had no further bleeding, but there was a continuous loss of weight from 131 lb. (59.4 kg.) to 102 lb. (46.3 kg.). In December, 1954, the patient entered the hospital for the repair of an abdominal hernia at the site of her colostomy incision. At this time her hemoglobin level was 13.4 Gm. %, and her white blood cell count was 6,050 per cubic millimeter, with 63% polymorphonuclear cells and 9% eosinophils.

Soon after her discharge from the hospital in December, the patient had episodes of vomiting, which increased in frequency. On readmission to the hospital on Feb. 3, 1955, she was vomiting four or five times a day. The vomitus, usually stained green, frequently contained recently ingested food, but not recognizable blood. On physical examination the patient weighed 90 lb. (40.8 kg.). The abdomen was not distended, and there were no abdominal masses. Four positional x-ray films of the abdomen indicated gas in the small intestine and numerous barium-filled diverticula of the colon. She was thought to have a partial obstruction in the midportion or lower part of the small intestine. A Miller-Abbott tube was passed. Her hemoglobin level was 13.5 Gm. %. She was rehydrated. On the day after her admission her serum sodium level was 121 mEq. per liter, serum potassium level 5.1 mEq. per liter, serum chloride level 94 mEq. per liter, blood urea nitrogen 25 mg. %, and serum bicarbonate level 21.6 mEq. per liter.

On Feb. 6 there was an unexplained rise in the white blood cell count from 13,000 to 23,000 per cubic millimeter. Oxytetracycline (Terramycin), streptomycin, and penicillin were given. Early on Feb. 9 she complained of a chilly sensation with her temperature rising to 100 F (38 C). She complained of headache but was completely rational. Later in the day she was found unresponsive, her neck was stiff, and she had a positive Kernig sign, a definite Babinski sign on the left, and questionable signs of a left-sided hemiparesis. A lumbar puncture revealed a cloudy spinal fluid with 8,000 white blood cells per cubic millimeter, 88% of which were polymorphonuclear leukocytes. Blood, urine, spinal fluid, and throat cultures all revealed gram-negative, extracellular, rod-shaped organisms. The patient appeared to be in shock with a blood pressure of 100/40 mm. Hg, temperature 100 F, pulse 120 per minute, and respirations 24 per minute. The abdomen was soft; no organs or masses were palpable. Later in the day there was a marked peripheral edema, and the white blood cell count was 30,000 per cubic millimeter, with 84% neutrophils. The erythrocyte sedimentation rate was 7 mm. per hour.

The organism in the blood stream and spinal fluid was identified as Escherichia coli, and, accordingly, penicillin therapy was discontinued and chloramphenical and sulfadiazine were added to her antibiotic therapy. She required levarterenol (Levophed) bitartrate for maintenance of blood pressure level, and therapy with hydrocortisone (Hydrocortone) was started. On Feb. 10 the patient became more responsive; she could answer simple questions and was aware of her environment. On Feb. 11 she was in shock, her blood pressure became unobtainable, and there was evidence of pulmonary edema. She was rapidly digitalized and also given streptomycin intrathecally. She died the same day.

The clinical diagnoses were (1) Esch. coli meningitis, (2) Esch. coli septicemia, (3) terminal pulmonary edema, (4) possible brain abscess of the right cerebral hemisphere, and (5) diverticulosis of the colon.

Autopsy

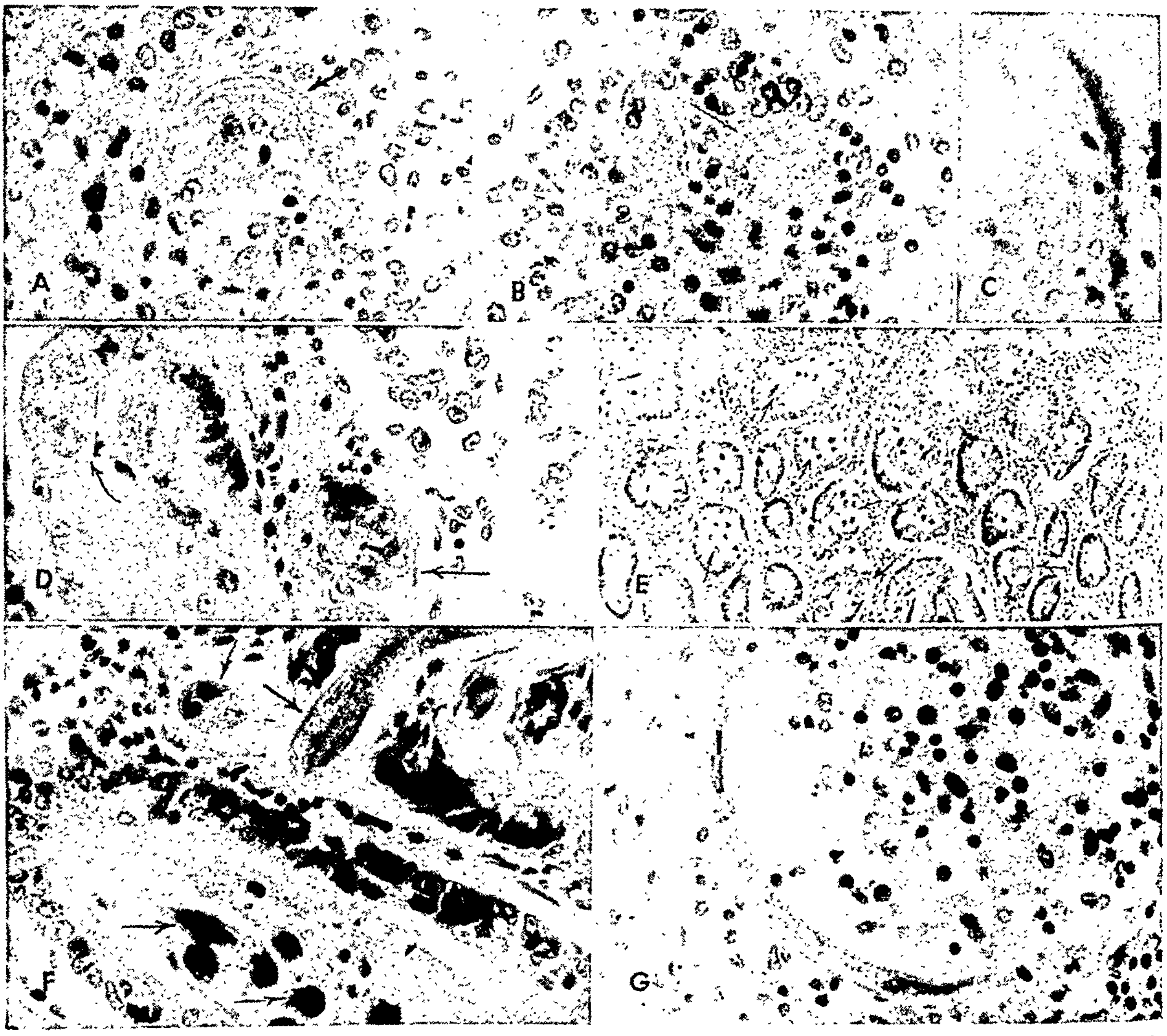
An autopsy was performed after one and one-half hours. Only the relevant pathological findings are reported here.

Gross Examination.—Each pleural cavity contained about 300 cc. of straw-colored fluid. The left lung weighed 750 Gm. and the right 875 Gm. There was extensive bilateral pulmonary hemorrhage. Grossly the small intestine was normal expect for dilation and severe edema of the duodenum and the proximal one-half of the jejunum. There were hundreds of diverticula in the colon. The mesenteric lymph nodes were four to five times average size. The subarachnoid space over the convexities of the cerebrum and cerebellum contained a profuse amount of greenish-yellow purulent material. The cisterna magnum and cisterna ambiens were filled with similar appearing material.

Microscopic Examination.—In the lungs there was extensive recent hemorrhage and scattered foci of acute lobular pneumonia associated with acute bronchitis and bronchiolitis. In addition, there were numerous filariform larvae in small branches of the pulmonary artery, in alveolar capillaries, and in the alveoli. Sometimes the larvae appeared coated with strands of fibrin, and sometimes they were marginated by a few mononuclear cells as they projected into the alveoli. No adult worms were seen in the lungs. The endothelial cells of the pulmonary arteries were moderately hyperplastic. Numerous larvae were also found in subpleural lymphatics and intrapulmonary lymphatics. They were accompanied by a mild to moderate chronic inflammatory response consisting of a few mononuclear cells, an occasional giant cell, some polymorphonuclear neutrophils, and occasional eosinophils. In some areas the eosinophilic infiltration was predominant.

There was severe, generalized fatty metamorphosis of the liver. Throughout the liver there were numerous small focal granulomatous lesions in which filariform Strongyloides larvae were found (see figure, *A*). These were in the portal areas, adjacent to portal veins, as well as within the hepatic lobules. They consisted of rounded collections of large mononuclear cells, multinucleated giant cells, polymorphonuclear leukocytes, some eosinophils, plus cellular debris and larvae. In some, the multinucleated giant cells had partially phagocytized the larvae (see figure, *B*); in others the mononuclears were surrounding the larvae. Many lymphatics in the larger portal areas also contained larvae associated with a polymorphonuclear, large mononuclear inflammatory response.

There were numerous filariform larvae in lymphatics of the portal vein, gallbladder, pancreas, adrenals, and thyroid and parathyroid glands. In the base of the gastric glands there were numerous rhabditiform Strongyloides larvae and an occcasional adult worm. The larvae were coiled and measured approximately 15 to 20 μ in diameter. In the bottom of the glands the larvae appeared to be surrounded by an acellular membrane. The larvae were also found in the lamina propria of the mucosa. Portions of adult female worms were seen also in the stroma of the lamina propria. Eggs (see figure, *D*), most of which were undergoing development, were also present in the glands and in the stroma, although some seemed to occupy an intraepithelial position. There were no ulcerations of the gastric mucosa, although the epithelium was hyperplastic. There was a moderately severe chronic inflammation in the lamina propria. There was no penetration of the adult worms beyond the muscularis mucosa.



Strongyloides infection. *A*, larva in liver. *B*, giant cell about larva. *C*, larva penetrating wall of colon into peritoneal cavity. *D*, eggs developing in stomach mucosa. *E*, larvae and eggs in duodenal mucosa. *F*, adult parasitic female and larvae in mucosa of duodenum. *G*, larva in mesenteric lymph node.

The changes in the duodenum (see figure, *E* and *F*) and jejunum were essentially similar to those seen in the stomach. In one high-power field 79 larvae were counted in the contents of the jejunum. Numerous larvae penetrated the lamina propria, the submucosa, the muscularis, and the subserosal lymphatics of the ileum. Occasionally the larvae in the muscularis were surrounded by large mononuclear cells, eosinophils, and a few polymorphonuclear leukocytes.

There was extensive diverticulosis of the colon with no evidence of diverticulitis. Numerous filariform larvae were found in the lamina propria, the muscularis, and in the subserosal lymphatics. The larvae were accompanied by the usual inflammatory response seen elsewhere. In one area larvae had penetrated through the serosa of the colon and projected into the peritoneal cavity (see figure *C*). Few larvae were present in the fecal material of the colon.

The lymph sinuses of the mesenteric lymph nodes (see figure, *G*) as well as the lymph node parenchyma contained numerous filariform larvae. Large mononuclear cells and multinucleated giant cells were marginating some of the larvae. In addition, some giant cells appeared to be phagocytizing the larvae.

The leptomeninges of the medulla, cerebellum, and spinal cord contained small numbers of polymorphonuclear leukocytes and lymphocytes. A few similar cells were seen in the walls of the leptomeningeal veins. The final diagnoses included severe S. stercoralis infection, Esch. coli septicemia, and Esch. coli meningitis.

Comment

The immediate cause of the patient's death was an overwhelming Esch. coli septicemia and meningitis. There was also a massive Strongyloides infection. The Strongyloides infection probably contributed to the patient's death in several ways. The larvae migrating in a hyperinfective cycle from the intestinal contents could have repeatedly carried Esch. coli on their surface or in their intestinal tracts into the blood stream. Such bacterial infections probably occur frequently in patients with Strongyloides infections. However, a robust person can probably control these bacteremias; otherwise fatalities in persons infected with Strongyloides would be more common. This patient, however, was debilitated and had lost 41 lb. (18.6 kg.) (30% of her weight) in a year, due partially at least to the massive Strongyloides infection. This may have been one of the factors increasing her susceptibility to bacterial infection. The massive larval invasion of many organs and especially the extensive migration of the larvae through the lungs, producing extensive hemorrhage, undoubtedly contributed to her death.

The patient lived in New York City continuously for 36 years prior to her death, and therefore her massive Strongyloides infection was, in all probability, due to the hyperinfective cycle of the parasite. It is very unlikely that infection from the soil occurred during her residence in New York. There are cases reported in which the infection has persisted for 20, 26, and 30 years, presumably without infection from an outside source. Except for the last year of her life, this patient was free of symptoms. Moreover, careful examination of serial sections of large intestine, removed at operation a year before her death, failed to reveal any Strongyloides in this tissue. However, at autopsy larvae were present in very large numbers. As many as 79 were counted per high-power field in the contents of the jejunum, and lesser numbers were counted in the contents of the colon. These findings are consistent with the activation of the hyperinfective cycle during the last year of her life after the partial sigmoidectomy. In addition, there was a gradual increase in the eosinophil count from 1% to 9% during this time. This may have been in response to an increasing larval migration.

Numerous filariform larvae were found in various tissues, and a number of them were obviously dead and undergoing necrosis and phagocytosis. It would appear that the entrapment and destruction of larvae in the tissues plays an important role in preventing overwhelming Strongyloides infections due to the hyperinfective cycle.

There has been considerable speculation concerning the existence of a parasitic male adult worm. It has been suggested that the adult male passes out of the gastrointestinal tract of the host after mating is accomplished. However, Kreis [3] reported the presence of parasitic male adult worms in the lungs of dogs. A careful examination of many lung sections from this patient failed to reveal adult worms of either sex. Over 600 adult parasitic females were collected from a portion of jejunum, yet not a single parasitic male adult worm was found.

600 W. 168th St. (32) (Dr. Brown).

References

1. Hinman, E. H.: Study of Eighty-five Cases of Strongyloides Stercoralis Infection: With Special Reference to Abdominal Pain, Trans. Roy. Soc. Trop. Med. & Hyg. **30**:531-538 (March) 1937. Levin, A. L.: Problem of Eradication of Strongyloides Intestinalis, Am. J. Trop. Med. **10**:353-363 (Sept.) 1930. Shikhobalova, N. P., and Semenova, N. E.: On Problem of Clinical Study and Treatment of Strongyloidosis, M. Parasitol. & Parasitic Dis., Moscow **11**:76-83 (May) 1942.

2. Faust, E. C., and De Groat, A.: Internal Autoinfection in Human Strongyloidiasis, Am. J. Trop. Med. **20**:359-375 (May) 1940. Gage, J. G.: Case of Strongyloides Intestinalis with Larvae in Sputum, Arch. Int. Med. **7**:561-579 (April) 1911. Kyle, L. H.; McKay, D. G.; and Sparling, H. J., Jr.: Strongyloidiasis, Ann. Int. Med. **29**:1014-1042 (Dec.) 1948. Nolasco, J. O., and Africa, C. M.: Fatal Case of Paralytic Ilius Associated with Severe Strongyloides Infestation Suggesting Internal Autoinfection, J. Philippine Islands M. A. **16**:275-283 (May) 1936. Ophuls, W.: Fatal Case of Strongyloidiasis in Man, with Autopsy: Life Cycle of Strongyloides Intestinalis in Man, Arch. Path. **8**:1-8 (July) 1929.

3. Kreis, H. A.: Studies on Genus Strongyloides (Nematodes), Am. J. Hyg. **16**:450-491 (Sept.) 1932.

COUNCIL ON DRUGS

Report to the Council

The Council has authorized publication of the following report.

H. D. Kautz, M.D., *Secretary.*

ORAL MEDICATION WITH PREPARATIONS FOR PROLONGED ACTION

Carl A. Dragstedt, M.D., Chicago

Historical Background

Attempts to prevent gastric irritation and vomiting by enclosing irritant drugs within gastro-resistant coatings are credited to Unna and others more than 100 years ago. Some of these early coatings consisted of keratin, phenyl salicylate (salol), or gelatin hardened in formaldehyde. The preparations were called enteric, since the objective was to have them withstand gastric digestion but, nevertheless, disintegrate and undergo absorption in the intestine. These preparations were not uniformly successful, with respect to this objective. On the one hand, some soluble drugs were found able to diffuse through coatings which were satisfactorily insoluble in gastric juice, and, on the other hand, some enteric preparations were so resistant to disintegration and solution that they traversed the entire gastrointestinal tract intact. Nevertheless, such preparations continued in use and served a somewhat useful purpose. Attempts to improve upon the enteric coatings were made at sporadic intervals, but in a more or less desultory fashion, since the reasons for doing so did not appear particularly persuasive or rewarding.

As years went by, an increasing number of drugs came to be administered by parenteral injection because of various sorts of limitations to their oral effectiveness. During the era when drugs were administered virtually exclusively as oral preparations, it was recognized that various drugs varied considerably as to the duration of their effects; however, parenteral administration emphasized this distinguishing characteristic among drugs, since the gross variable due to gastrointestinal absorption presumably was eliminated. This, in turn, served to focus attention upon the fate of the drug within the body and upon the roles played by bindings, chemical change, storage in inert depots, and excretion in determining the duration of the drug's sojourn in the body and the consequent duration of its effect. More simply, parenteral administration emphasized the importance of learning the time-course of this disposal even in the instances in which mechanisms were little understood, or conversely of learning the blood levels achieved by various drug dosages and the time-course of the subsequent declines in these levels.

It was inevitable, of course, that the duration of action of a number of drugs did not coincide with the clinical or therapeutic desiderata. When the action was substantially longer than desired, attention was directed toward synthesizing shorter acting congeners; when the action was substantially shorter than desired, recourse was made to several devices. Some of these, such as the use of probenecid to impair the renal excretion of penicillin, are unrelated to the current topic. More commonly, efforts were made to delay, and thus prolong, the absorption of the drug from the injected site. This proved exceptionally fruitful. The various penicillin and insulin preparations may be cited as outstanding examples of successes in this direction.

These successes with injectable preparations reawakened interest in the possibility of modifying oral preparations of drugs so as to delay and prolong the absorption and thereby the action of the active ingredients, with the comparable objective of improving their therapeutic effects. As a result of this interest, the market is now more or less deluged with preparations purporting to have delayed action, repeat action, and sustained action. The rush to prepare all sorts of medicaments in some one of the prolonged forms has been so great that one manufacturer taunted his competitors by preparing a long-acting placebo. Before the contagion becomes too general, it seems appropriate to survey the problem in a general way.

Preparations for Prolonged Action

Manufacturing Methods.—The methods for making preparations designed for delayed disintegration and absorption will be referred to only in general terms since this is a pharmaceutical problem. Most of them fall into two categories: (1) those in which the active drug is coated with some agent more or less resistant to gastric digestion or which dissolves or disintegrates slowly in any fluid (e. g., fats, waxes, fatty acids, shellacs, glycerinesters) and (2) those in which the active drug is adsorbed on an ion-exchange resin from which it is rather slowly

---

Professor of Pharmacology, Northwestern University Medical School.

cluded. An enormous variety of agents of the first category has been studied, and their very number is something of a mute testimonial to the fact that none has been found to be uniformly successful. They are marketed in the form of tablets, capsules, and liquid suspensions. Some of them are made after the fashion of the old-time "jaw-breaker" candies of our childhood days, the alternating concentric rings of assorted colors in the candy having their counterpart in alternating rings of coating material and drug. Still others are prepared by incorporating the drug with sugar pellets or other nuclei, coating these nuclei with varying thicknesses of a selected coating material, and preparing the ultimate dose-form (whether capsule, tablet, or liquid) by assembling an appropriate conglomerate of coated and uncoated pellets. The repeat-action product is a preparation (most commonly tablet but not necessarily so) in which the two or three doses of the active ingredients that the unit contains are released at two or three presumably predetermined time intervals. Usually the first dose is released when the sugar coating dissolves and the subsequent portion when the tablet disintegrates. The sustained-action product is a preparation (capsule, tablet, or liquid) which purports to release a portion of the active ingredient relatively promptly and subsequent portions more or less uniformly throughout the ensuing period of 6 to 12 hours. Several variants to these patterns (e. g., combined types) are also available.

Advantages.—The advantages claimed for these prolonged forms of medication are obvious. Medication taken once a day instead of two, three, or four times eliminates the inconvenience for the ambulatory patient of taking medication when away from home (and thereby forgetting some doses) and saves the time of the nurses charged with distributing medicaments to institutionalized patients. A more substantial advantage claimed is that administration of these prolonged forms obviates the peaks and valleys of drug concentration in blood and tissues, which are associated with intermittent administration of ordinary preparations, and enables certain drugs to maintain their effectiveness through the bedtime hours. Thus, there are a number of areas in which the employment of prolonged forms of medication presents opportunities for improved therapeutic effects. For example, it is generally agreed that there is an increased nocturnal secretion of gastric juice in the average patient with duodenal ulcer and that most cholinergic blocking agents usually reduce gastric secretion for only two to four hours (if at all), when given in ordinary therapeutic doses. Therefore, there would be some merit to a preparation which would prolong such an action to eight hours or so. Likewise, smoothly sustained blood levels of sulfonamide compounds and antibiotics are to be desired, since the chemotherapeutic effectiveness of a number of such agents has been closely correlated with the steady maintenance of adequate blood and tissue levels of drugs.

Specific Problems.—Acknowledging the praiseworthy objective of prolonged preparations in certain fields does not, however, necessarily constitute an admission that they achieve this objective in these fields, nor constitute an encouragement to the extension of such preparations in a random or widespread manner. Some simple facts must be borne in mind, with respect to the problem. Administering a drug preparation by mouth involves many more variables than when it is injected intramuscularly or subcutaneously. It may enter a stomach with or without food, and with or without much gastric juice. It may remain there for widely variable periods of time and then be emptied into an intestinal tract, which also may vary as to the digestive juices with which it accosts the preparation and the celerity with which it transports it to the outside world. It would be rather a meaningless exercise to determine the averages of such variables, since only a minority of individuals could be expected to coincide with such averages. It seems probable, therefore, that it would be almost futile to devise protective coatings which would ensure uniform times for disintegration and absorption from patient to patient.

Campbell and co-workers[1] from the Food and Drug Laboratories of Canada have studied what they call the "physiological availability" of drugs in various preparations, by determining the percentages of administered drug that is absorbed. Using agents whose absorption could be determined with some precision (riboflavin and sodium aminosalicylate) and administering the agents by means of tablets which had varying disintegration rates when tested by a modification of the U. S. P. tablet-disintegration method, they found that "to ensure complete availability, simple tablets should have an in vitro disintegration time of less than 60 minutes as determined by the official method." On examining 11 commercially available prolonged-action preparations, they found that 10 of these had in vitro disintegration times of more than 60 minutes, indicating, by inference, that for all of these the physiologically available drug contained therein would be something less than the labeled amounts.

Their studies are sufficiently convincing to warrant the statement that a preparation which actually succeeds in delaying the disintegration of the administered form, and thereby the absorption of the active ingredient to any dependable degree, inevitably does so at the expense of some loss in precision of dosage. The corollary of this would seem to be that no drug for which precision of dosage is of paramount importance should be administered by a prolonged-type preparation. This applies to a considerable number of drugs of which the digitalis glycosides may be cited as examples.

There is a second corollary which can be drawn from their studies. When a drug is normally irregularly or incompletely absorbed after oral administration as compared with parenteral injection, it seems inevitable that this erratic behavior would be accentuated by administering it in one of the prolonged-type preparations. There are quite a number of such drugs, and they may be readily recognized by noting the marked disparity between the oral dose and the parenteral dose when the drugs are administered both ways. Several of the ganglionic blocking agents used in the management of hypertension illustrate this characteristic. A number of published reports support the contention that administration of prolonged-type preparations leads to (1) a more prolonged effect than that produced after administering ordinary preparations and/or (2) a more evenly sustained level of drug in the blood. Unfortunately the great majority of these reports state that 10 mg. of drug "X" given as a prolonged-type preparation resulted in a longer duration of clinical effects than did 5 mg. or so of drug "X" given as an ordinary preparation. Of course it should! So would 10 mg. of drug "X" given as an ordinary preparation. Only a few drugs (e. g., alcohol) have a more or less fixed rate of disposal, so that increasing the dose increases the duration of action more or less to an equal degree. Nevertheless, for the great majority of drugs, whose disposal is patterned along the lines of so-called decay curves, an increased dosage results in a definite increase in the duration of its effects, even though this is not a direct relationship. In a few studies, determinations of blood levels have been adequate enough to establish that there is less "peak and valley" rise and fall in such levels after administration of prolonged-type preparations as compared with ordinary preparations. These are quite convincing, but it should not be forgotten that *such evidence, which is valid for drug "X," cannot* be construed as applying necessarily to drugs "Y" or "Z."

Contraindications.—Mention was made previously of some areas in which prolonged-type preparations would appear to offer advantages. It is equally appropriate to mention some areas or circumstances in which they would appear to be contraindicated. In addition to the contraindications which stem from the behavior of the drug as to characteristics of absorption and duration of action, there are clinical considerations which challenge the advisability of prolonged-type preparations for certain drugs. One may include here, at least as being debatable, the employment of prolonged-type preparations for the amphetamines and other anorexigenic agents used in the treatment of obesity. In view of the lack of general agreement as to the mechanism by which these drugs have an anorexigenic action and the likelihood that they are not effective without some attendant central and cardiovascular stimulation, their employment for this purpose may be more of a price to pay than the trivial villainy of eating between meals is worth.

Still more questionable, in my opinion, is the use of prolonged-type preparations of glyceryl trinitrate (nitroglycerin) in angina pectoris. This agent has achieved its deserved reputation because it is rapidly absorbed when given sublingually and is quickly effective in relieving an anginal attack. The value of any of the nitrites as prophylactic agents is less firmly established, and the shift to a swallowed administration form is a shift to a much more erratic absorption for glyceryl trinitrate, whether coated or not. Indeed, in one controlled study, oral administration of 2-mg. capsules of the drug, four times daily, was found to be no more effective than a placebo for controlling anginal pain.[2] Moreover, the currently marketed prolonged-type preparations of this drug are viewed with grave misgivings. They are available as oral tablets containing 2.5 and 6 mg., which represent from 6 to 15 times what is generally considered to be the optimum sublingual dose of 0.4 mg. Accordingly, in view of repeated reports[3] that only minor increments in dosage beyond this optimum may produce, in occasional patients, the so-called paradoxical effect of a reduced coronary flow with attendant collapse (consequent to a venous pooling in the lower extremities and diminished venous return to the heart), the administration of such preparations assumes a degree of precision in their rate of absorption which strains one's credulity. Experience may prove that misgivings are groundless in both of these instances, but the reasons for them illustrate the attitude with which the substitution of prolonged forms for ordinary forms of administration should be viewed.

Summary

No drug whose precision of dosage is important should be administered by a prolonged-type preparation, because a bona fide decrease in disintegration and absorption necessitates an unknown decrease in physiological availability. Drugs whose normal absorption from the gastrointestinal tract is impaired or erratic should not be administered by prolonged-type preparations. The administration of drugs in a prolonged-type preparation should be viewed with misgiving if the total dose administered is more than two or three times the usual therapeutic dose, unless the drugs concerned are known to have substantially wide margins of safety between therapeutic and toxic ranges. These restrictions leave a substantial area in which there is reason to anticipate that the employment of prolonged-type preparations should offer advantages over conventional preparations. At present, there is grave disagreement as to the relevance of in vitro tests, with respect to predicting the behavior of prolonged-type preparations when administered to patients. It seems unlikely that variations in the tests will dispel this uncertainty, since the variability

between patients will remain, no matter how standardized the in vitro procedures become. The cautious physician would be wise not to become unwarrantedly optimistic as to the precision with which the prolonged-type preparations can achieve the theoretical goals envisioned for them.

References

1. Campbell, J. A.; Chapman, D. G.; and Chatten, L. G.: Timed Disintegration Medication—Need for More Quantitation Criteria, Canad. M. A. J. **77**:602-603 (Sept. 15) 1957. Chapman, D. G.; Chatten, L. G.; and Campbell, J. A.: Physiological Availability of Drugs in Tablets, ibid. **76**:102-106 (Jan. 15) 1957. Chapman, D. G., and Campbell, J. A.: Reliability of Riboflavin Excretion Technique in Determining Availability of Coated Tablets, Canad. J. Biochem. & Physiol. **33**:753-757 (Sept.) 1955. Chapman, D. G.; Crisafio, R.; and Campbell, J. A.: Relation Between in Vitro Disintegration Time of Sugar-Coated Tablets and Physiological Availability of Sodium *p*-Aminosalicylate, J. Am. Pharm. A. (Scient. Ed.) **45**:374-378 (June) 1956.

2. Friend, D. G.; O'Hare, J. P.; and Levine, H. D.: Action of Triethanolamine Trinitrate in Angina Pectoris, Am. Heart J. **48**:775-779 (Nov.) 1954.

3. Russek, H. I.; Urback, K. F.; and Zohman, B. L.: Paradoxical Action of Glyceryl Trinitrate (Nitroglycerin) in Coronary Patients, J. A. M. A. **158**:1017-1021 (July 23) 1955.

COUNCIL ON FOODS AND NUTRITION

The following is one of the six papers presented at the symposium on "Nutrition in Pregnancy" in Columbia, Mo., Oct. 11, 1957. This symposium was sponsored by the Council on Foods and Nutrition, with the cooperation of the Boone County Medical Society, the University of Missouri School of Medicine, and the Adult Education and Extension Service of the University of Missouri.

Philip L. White, Sc.D., *Secretary,*
Council on Foods and Nutrition.

NUTRITIONAL STATE OF THE MOTHER PRIOR TO CONCEPTION

Genevieve Stearns, Ph.D., Iowa City

The best provision for well-being in any period of life is to arrive at that point in good nutritional and physical status. The well-born infant is sturdier throughout infancy than the baby poorly born; the sturdy infant has stores to give impetus to growth in the preschool years. The child who is in excellent nutrition will have stores to be drawn upon during the rapid growth at puberty. The well-nourished mother can nourish her fetus well; therefore, the best insurance for a healthy infant is a mother who is healthy and well nourished throughout her entire life, as well as during the period of pregnancy itself.

Present mortality statistics show that, though we have made impressive progress in lowering the death rate of children under one year of age, the neonatal death rate is still declining too slowly. The fetal and neonatal death rates, plus the number of incurably damaged infants, total a wastage that is far too high. In any study of such wastage, the conviction grows that long-term, poor nutrition of the mother is one of the most important factors. Proof of this is obviously difficult to obtain.

Importance of Nutritional Status Prior to Conception

Animal studies have shown that severe nutritional deficiency prior to conception results in death or abnormality of the fetus.[1] The deficiencies in the maternal animal are carefully graded not to be sufficiently severe to cause death of the embryos, yet sufficiently serious to cause malformations in many of the fetuses. The degree of deficiency needed to produce fetal or neonatal death, malformations, or premature delivery in the human mother cannot be determined easily. Yet both historical evidence and careful observational studies give evidence that the long-term nutritional status of the mother is an important factor in determining the health of her infant.

In any war, large numbers of people are subjected to nutritional changes usually detrimental. Smith,[2] in reporting on wartime starvation in Holland, noted that the food situation there began to deteriorate in October, 1944, and by December of that year reached a low level that was steadily maintained until liberation in May, 1945. Previous to October, 1944, rations for pregnant women and nutrition in general were fairly good. During the early part of 1945, pregnant women had available less than 1,000 calories and from 30 to 40 Gm. of protein daily. The hunger period thus represented a period of acute undernutrition after four years of regulated but reasonably adequate nutrition. Babies conceived before and born during the hunger period were shorter and weighed less than those born before this period. The incidences of stillbirth, prematurity, and congenital malformation were not significantly increased. It appears that during periods of acute hunger, after several years

---

From the Department of Orthopedic Surgery, College of Medicine, State University of Iowa.

of at least fair nutrition, the mother's own body can provide sufficient nutrients to bring her fetus to term. During the hunger period, amenorrhea was common, and too few babies were conceived for data on stillbirths, prematurity, and neonatal death rate to be statistically reliable.

The results of the Holland study were interpreted as evidence that fetal growth in weight and length was mostly affected by the mother's diet during the latter part of pregnancy. By this same criterion, the rate of development and the viability of the fetus must be affected chiefly by the maternal status well before the last half of pregnancy. Smith comments that "the results of any form of dietary inadequacy must vary in accordance with its extent in time, with the period of gestation in which it occurs, and especially with the duration of inadequacy before pregnancy."[2]

The siege of Leningrad lasted from August, 1941, to January, 1943. The food situation was at its worst between August, 1941, and February, 1942. That winter was unusually severe, with no heat available for the houses, and the food supply was both insufficient and of inferior quality. The chief staple was a bread, one-half consisting of a defective rye flour and the rest being such substitutes as cellulose, bran, and malt. The status of newborn infants was reported by Antonov[3] for 1942, compared with the data for previous years. The birth rate fell strikingly, and the stillbirth rate doubled during the first half of 1942. The incidence of prematurity increased to 41.2% of the total live births. Nine per cent of the full-term infants and 31% of the premature infants died during the neonatal period. During the second half of 1942, so few babies were born as to warrant investigation into the nutritional status of their mothers. Apparently only women able to get considerable additional food during the entire period were able to conceive during the siege. Amenorrhea was widely prevalent.

Why did the results in Leningrad differ so strikingly from those in Holland? The answer seems to lie in the fact that the women in Leningrad had not been on a regulated, fairly adequate diet regimen before the siege. During the siege they were often compelled to do outdoor work in bitter cold weather; calories ingested had to be used to maintain body heat. It seems highly probable that chronic malnutrition of some degree for a long period was followed by the acute undernutrition and malnutrition of the siege period. The fact that even the full-term infants had conspicuously low vitality, suckled poorly, and had low resistance to infection supports such a conclusion. The mothers had insufficient nutrients to give from their own bodies.

Baird[4] has commented that the conspicuous drop in stillbirth rates which occurred during World War II in the British Isles was ascribed wholly to improvement in the diet of pregnant women. Despite the anxiety and stress of the early war years, the stillbirth rate showed a drop of 3 per 1,000 births between 1939 and 1941. By 1942, the scheme of food priorities was well established, and the war situation had improved. After 1942, the rates for prematurity, congenital debility, and birth injury fell markedly. No further decrease has occurred since 1948. Baird raises the question as to whether further improvement must wait for improvement in nutrition throughout growth, resulting in better physique. "We cannot attain a minimum rate till all mothers have had the advantage of good food and environment since infancy."

A statistical survey of infant mortality in Great Britain in relation to social class[5] also brought out the marked drop in stillbirth and neonatal mortality discussed by Baird. Yet, though over-all lowering was impressive, the relative distribution of these early deaths among the five economic classes had not changed. The gap between the death rates for professional and managerial classes (class 1) and unskilled workers (class 5) was as wide in 1948 as in 1928, though the whole curve showed a steady decline. Since all pregnant women during the war showed improved nutritional status, these relative differences were ascribed, at least in considerable part, to the poorer lifetime nutrition of the mothers from the lower class.

Thomson,[6] in an ingenious study planned to assess the results of lifetime diets, reasoned that girls always well nourished in all nutritional essentials would grow to the full height that their heredity would permit and would be in vigorous health. On the contrary, girls ill-nourished throughout all of childhood would be somewhat stunted and in poor health. If a large number of pregnant women were to be studied, the influence of these factors could be distinguished. A survey of nearly 3,500 primiparas in Aberdeen, Scotland, showed minimum prematurity rates (32 per 1,000 live births) and neonatal death rates (19 per 1,000 live births) among infants born to mothers 64 in. and over in height and in good general health. Significantly higher rates (91 per 1,000 and 37 per 1,000 live births, respectively) were found among infants of women who were both small in stature (under 61 in.) and in unsatisfactory health. Several hundred women were included in each group.

In the United States, Burke and collaborators have studied the relation between diets of mothers and the physical status of their successive siblings. The authors state that "all of the stillborn infants, all of the neonatal deaths but one, all of the premature infants but one (a neonatal death), all of the functionally immature infants, and most of the congenital defects were found in the group of infants born to mothers with 'poor' or 'very poor' prenatal diets. Since no major effort was made to change the dietary habits of these women, it is probable that in the majority of cases the prenatal dietary rating was representative of long-time food habits." When the diet histories showed that the food habits of the mothers had improved materially before the birth of the second sibling studied, the condition of these second infants was also improved; if the mother's diet had deteriorated, so did the condition of her infant, compared to his earlier born sibling.

In a recent review, Garry[8] stressed the fact that pregnancy and lactation, though normal processes, do provide additional stress. A diet just satisfactory for the nonpregnant woman may be insufficient for her during pregnancy.

Studies of indigent pregnant women in Iowa have shown that the diets ingested by pregnant women do not differ conspicuously, except in quantity, from their lifetime diets.[9] With few exceptions, a woman whose diet is poor in pregnancy can be considered as having had a poor diet since early childhood. Conversely, a woman whose dietary habits are good when she enters pregnancy usually has been well nourished throughout life.

Of 404 women studied, only 37 ingested more than 75% of the amount listed in the National Research Council's Recommended Dietary Allowances (1948 edition) for each of the 10 nutrients studied. Many of these 37 achieved sufficient amounts of the given nutrients only at the expense of excessive caloric ingestion, for their food choices included too much carbohydrate food. The diets of 110 women were classed as poor, and 76 were classed as very poor. Though only 29 women ingested less than 1,800 calories daily, 44% of the entire group of 404 women was classed as poorly nourished, the remainder having fair to excellent nutrition.

Three per cent of the 227 women with fair to excellent dietary habits delivered single infants prematurely.[10] Usually, these women had had five or more pregnancies in rapid succession. Such a woman needs unusual care given to her nutrition in order to avoid depletion. All the infants were in good condition, and the smallest weighed 1,970 Gm. (4.3 lb.). In contrast, 10% of the 177 mothers in the group who had always been poorly nourished delivered prematurely. One infant was stillborn, 4 were born with severe congenital anomalies, and 5 of the 10 infants born alive died within the first week. Six of the 12 mothers whose diets were the poorest and who delivered prematurely were under 21 years of age. It was the first pregnancy for five of the mothers and the second for the sixth mother. These young mothers were not physiologically equal to the task given to them. Their dietary histories gave evidence of poorly chosen diets since early childhood.

Nutritional Status of Women of Childbearing Age

In the United States, it appears that in all strata of society the adolescent girl has the poorest diet of any member of the family. The urge for slenderness and the compulsion to do as the group does result in the girl's refusal to eat nutritious food at home; yet she snacks frequently at the gathering places for her group. The result too often is the ingestion of a decidedly unbalanced diet. Milk is eschewed because it is considered fattening. High-carbohydrate snacks are ingested at such times that appetite for meals is destroyed; however, the food ingested does not satiate, and more snacking is indulged in, often to the point of obesity. The girl is malnourished, and her plane of nutrition is low.

At the State University of Iowa, a group of adolescents with severe dental caries was studied. An unexpected time-lag in the improvement of the incidence of caries was found in the group when given a good dietary regimen. Such a time-lag indicated that the amount of time required to raise a subject to a higher plane of nutrition might vary with the length of time the subject has been maintained in poor nutrition and with the relative difficulty of absorption and utilization of the nutrients involved. To accomplish an increase in absorption of those nutrients normally absorbed with some difficulty, such as calcium and iron, might take more time than to achieve an increased absorption of those nutrients readily soluble in water which are rapidly and completely absorbed. For these reasons, we studied the retention of calcium, phosphorus, and nitrogen by three groups of girls from 11 to 18 years in age.[11]

All the girls had received an adequate amount of calories. The diets of the first and third groups were considered as only fair, although they did contain one and a half pints of milk daily and were better diets than many children receive. The second group had had an excellent diet for at least four years. When the first and second groups were given a series of increasingly good diets, the well-fed girls utilized the nutrients better, as evidenced by a calcium retention nearly double that of the previously less well-fed girls. We had expected the opposite. It took five months for the group previously having poorer diets to equal the daily retention of the group with consistently good diets when both were on the same dietary regimen.

The third group, comparable nutritionally to the first group, was given a standard dietary regimen including a quart of vitamin D milk daily with ample amounts of protein, calories, and vitamins. Calcium retention, although poor at first, increased steadily. After five months of this regimen, the mean retention values were as high as those of group 2. During the final four months of the study, each girl maintained a daily calcium retention ample enough to achieve and maintain a well-calcified skeleton.

Another unexpected finding in this study was that emotional disturbance resulted in a prompt decrease in calcium retention by each girl, regardless of previous diet or nutrition. The amount of decrease in retention tended to parallel the degree of emotional upset. The emotional instability of adolescents is well known and undoubtedly is a major factor contributing to their malnutrition, particularly that of girls.

Many of these young girls who have always lived on a low nutritional plane will enter marriage with no nutritional training, with their own nutritional stores incomplete, and with the emotional instability of adolescence often at its maximum. Can this girl's body, inadequately nourished and with no reserves, provide nutrients for another body and at the same time build up her own uterine and abdominal musculature and the other tissues necessary in pregnancy?

A study of girls and young women illegitimately pregnant, aged from 13 to 30 years, was then undertaken in our laboratory to determine whether pregnancy itself increased the ability of the girl to absorb and retain nutrients, whether emotional distress was an important factor during pregnancy, and whether increased age of the mother altered either of these factors.[12] The educational status of the subjects varied from grade-school to college students. Throughout the age range studied, all emotionally stable subjects were able to absorb and retain more nutrients than were needed by the fetus. Girls from the poorest nutritional backgrounds were able to retain as much as girls whose nutritional background had always been good. Pregnancy itself, therefore, increases the utilization and storage of essential nutrients, provided that they are ingested. Unfortunately, the sensitivity to emotional distress remains; retention values reflected each disturbing influence. The subject most continuously disturbed over her situation lost calcium steadily during the study. Her total calcium loss was at least double the amount used by her fetus. Her losses of phosphorus and nitrogen were less striking but left her body with a serious deficit.

If the young pregnant woman remains emotionally stable and ingests a good diet, she is in an excellent position both to improve her own nutritional status and to produce a sturdy full-term infant. Obviously, the earlier in pregnancy her nutritional habits can be improved, the better for both her infant and herself.

The girl who marries during her mid-teens is apt to be a girl poorly nourished through most of her lifetime and to be equally ill-equipped to meet the many psychological problems inherent in establishing a successful marriage and the new family. It is not surprising, therefore, that she is the least successful mother in producing a healthy full-term infant. These young adolescent girls greatly need counseling in nutrition and in the whole area of preparation for successful family life.

Nutrition Education

The nutritional status of any person may be improved at any time of life, provided that the needed nutrients are available and interest is aroused toward improving the nutritional status. At what ages are chances for success best? Nutritional habits of families tend to remain relatively constant for generations, a fact particularly true among lower-income families. If the adolescent breaks with family tradition, it is usually in the direction of poorer nutrition. Marriage usually returns the new family to the traditional pattern, modified somewhat by the food likes and dislikes of the spouse.

Within the family, the infant occupies a favored position. The public is educated to expect supervision of the baby's nutrition, and free clinics make this possible. After the child can feed himself at the family table, his nutritional status is apt to deteriorate. The family needs further education concerning the nutritional needs of children during the preschool years. The grade-school child is active, hungry, and relatively uncritical in matters of food. The adolescent boy asks only for quantity. The adolescent girl prizes social status above all, and she will sacrifice everything to achieve a slender, well-dressed appearance and to conform to the habits of her group. The younger the child, the easier it is to change his habits in the direction of improvement in nutrition. His response to diet is also more rapid than that of the older child. The adolescent with a poor nutritional background, emotional instability, and insistence on conformity with the group has the greatest need but is the most refractory to nutrition education.

It appears that the two ages most amenable to change in dietary habits are the grade-school child and the young pregnant woman. If taught good nutritional habits in school, usually the child insists that the parents follow directions, for school, at that age, is gospel. The teaching of nutrition in school at this age throws the burden on the already overworked teacher or school-lunch supervisor, but much can be accomplished. The adolescent girl must be approached through the medium of beauty and popularity, not nutrition per se. If improvement in diet can be made fashionable among her own group, the chance for success is improved. Too often, however, knowledge of nutrition learned in the grades is discarded by the high-school girl.[13]

The importance of good nutrition in this group is so great that no steps toward its improvement should be neglected. Organized groups for teen-agers, such as Girl Scouts, 4-H Clubs, Camp Fire Girls, and others of like nature, should be encouraged to stress good nutrition and to give credit for its achievement. Nutritionists must learn the proper psychological approaches for teen-agers. School lunches should conform to good nutritional standards, and, most of all, nutritious foods should be made more easily available than their poorer counterparts. The substitution of milk-dispensing machines for soft-drink dispensers when tried has resulted in improved nutrition. When the school may receive a larger percentage from the sale of soft drinks, often this change is not made because the penny in the pocket is more valuable than the health of the child. If the school does not practice what it preaches, how can we expect the children to exceed our wisdom?

The young woman in her first pregnancy wants help, and she wants a healthy baby. If she is not interested in her own nutrition, such interest can often be stimulated by discussing with her the chances of lessened trouble for herself and the increased ease of care of her infant.

Pregnancy is a time when a woman seeks medical advice early. Nutritional advice well-presented in early pregnancy is more apt to be taken. If the habits of the community are such that the mother comes to the physician only in late pregnancy, dietary advice is still advisable. All such advice must be geared to her previous food habits and to her purse, or it will not be used. In other words, her diet must be improved but not changed entirely. A printed diet list is useless unless accompanied by full discussion of how it can be fitted in with the mother's customary food habits.

No discussion of diet improvement in the young mother is complete without including a discussion of the dietary habits of the prospective father. Often he is the chief stumbling block to improvement of the mother's diet or that of the family. He often has strong food prejudices and adheres to them at least as stubbornly as his wife to hers. Since young children are apt to imitate their father's habits, his influence on the family's nutrition is important.

If the prospective father can be convinced that it is an essential part of his duties as a father to see that his wife eats the food proper for production of a healthy infant, that it will be necessary for him to eat the same food in order not to increase her work unnecessarily, and that he will in no way be harmed by such a diet (in fact, it may even help the next baby), young fathers-to-be are more docile about changes in their own food habits. In practice, if each parent tends to guard the other's diet, both improve their food habits. If both parents eat a thoroughly good diet for eight months, the pattern is set, and another family is started in good nutritional habits. Each family trained in good nutritional habits increases the number of well-born infants.

Summary

It appears certain that pregnancy wastage and neonatal mortality are greater when the nutrition of the mother is habitually poor. It seems highly probable that further decrease in stillbirth rate and neonatal mortality will follow improvement in lifetime nutrition, which is desirable at any stage in the reproductive or the life cycle. If the nutritional level of the mother is low, improvement of her nutrition, even in the third trimester of pregnancy, improves the status of the infant.

The ideal situation is the maintenance of excellent nutrition from conception throughout life. The American public is thoroughly educated only in regard to infant nutrition but needs the same thoroughness of education for each age group throughout life. At present, the nutrition of adolescent girls, the age group least amenable to nutrition education, is usually poorer than that of younger children, although their needs are high. Children of grade-school age and pregnant women, if properly approached, seem the groups most receptive to nutrition education. Of these two groups, the latter is more generally available to the physician. Serious efforts should be made to provide nutritional education to all ages, wherever and whenever possible.

References

1. Warkany, J.: Manifestations of Prenatal Nutritional Deficiency, in Harris, R. S., and Thimann, K. V.: Vitamins and Hormones: Advances in Research and Application, New York, Academic Press, Inc., 1945, vol. 3, pp. 73-103. Pfaltz, H., and Sevringhaus, E. L.: Effects of Vitamin Deficiencies on Fertility, Course of Pregnancy, and Embryonic Development in Rats, Am. J. Obst. & Gynec. **72:**265-276 (Aug.) 1956.

2. Smith, C. A.: Effect of Wartime Starvation in Holland upon Pregnancy and Its Product, Am. J. Obst. & Gynec. **53:**599-608 (April) 1947; Effects of Maternal Undernutrition upon Newborn Infant in Holland (1944-1945), J. Pediat. **30:**229-243 (March) 1947.

3. Antonov, A. N.: Children Born During Siege of Leningrad in 1942, J. Pediat. **30:**250-259 (March) 1947.

4. Baird, D.: Influence of Social and Economic Factors on Stillbirths and Neonatal Deaths, J. Obst. & Gynaec. Brit. Emp. **52:**339 (Aug.) 1945.

5. Morris, J. N., and Heady, J. A.: Social and Biological Factors in Infant Mortality: Objects and Methods, Lancet **1:**343-349 (Feb. 12) 1955. Heady, J. A.; Stevens, C. F.; Daly, C.; and Morris, J. N.: Social and Biological Factors in Infant Mortality: Independent Effects of Social Class, Region, Mother's Age and Her Parity, ibid. **1:**499-503 (March 5) 1955.

6. Thomson, A. M.: Technique and Perspective in Clinical and Dietary Studies of Human Pregnancy, Proc. Nutrition Soc. **16:**45-51, 1957.

7. Burke, B. S.; Stevenson, S. S.; Worcester, J.; and Stuart, H. C.: Nutrition Studies During Pregnancy; Relation of Maternal Nutrition to Condition of Infant at Birth: Study of Siblings, J. Nutrition **38:**453-467 (Aug.) 1949.

8. Garry, R. C.: Nutrition in Pregnancy, Proc. Nutrition Soc. **16:**37-38, 1957.

9. Jeans, P. C.; Smith, M. B.; and Stearns, G.: Dietary Habits of Pregnant Women of Low Income in Rural State, J. Am. Dietet. A. **28:**27-34 (Jan.) 1952.

10. Jeans, P. C.; Smith, M. B.; and Stearns, G.: Incidence of Prematurity in Relation to Maternal Nutrition, J. Am. Dietet. A. **31:**576-581 (June) 1955.

11. Stearns, G.: Nutritional Health of Infants, Children and Adolescents, Proceedings of National Food and Nutrition Institute, Agriculture Handbook 56, United States Department of Agriculture (Dec.) 1952.

12. Stearns, G., and others: Unpublished data.

13. Whitehead, F. E.: Dietary Studies of School-Age Children in Ascension Parish, Louisiana, Am. J. Pub. Health **42:**1547-1551 (Dec.) 1952.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . AUSTIN SMITH, M.D.
Associate Editor . . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

DYSMENORRHEA

ALTHOUGH theoretically menstruation should be a painless physiological function, many apparently normal young women have dysmenorrhea. In fact most women have some cramping, but, considering it normal, pay little attention to it. Because of its subjective nature the intensity of this pain is hard to evaluate. Estimates of the incidence of dysmenorrhea vary widely. Smith and Norris [1] state that it affects about 35% of all women but in most of these it does not seriously interfere with their activity. It is a great nuisance for employers, and some industrial surgeons believe it is used by some as an excuse to obtain time off. This idea would seem to find some support in the fact that Smith and Norris found that about 16.5% of the women in an industrial survey required time off for this reason whereas in a survey of high school and college girls the incidence was only about 3%.

Dysmenorrhea may be secondary to such conditions as cervical stenosis, pelvic inflammatory disease, uterine tumors, and endometriosis, but when no specific cause can be found the symptom is considered primary. Most cases fall into the latter category.[2] A psychological element appears to play a large part in the production of menstrual pain. Patients with dysmenorrhea in general were less well adjusted emotionally as children and showed more anxiety in connection with bodily functions than nonsufferers.[3] An exaggerated fear of recurring cramps followed by cramps may set up a vicious cycle and result in a morbid dread with an aggravation of all symptoms. The mechanism of the pain has been shown to be similar to that of angina pectoris—spasm producing a temporary local ischemia. The pain is usually maximal at the onset and accompanied by a scanty flow. As the spasm relaxes a normal flow is established and the pain disappears. In severe cases the patient may have nausea, vomiting, and syncope. Dysmenorrhea may become much less severe after marriage or childbirth, but this is not always the case.[4]

Treatment requires patience, skill, and sympathy. Before any definite course of treatment is tried it is important to get a complete history including information about the usual diet, occupation, and exercise taken.[5] Examination should include observations of posture, hemoglobin determination, and basal metabolic rate and other tests of thyroid function. Any organic causative factor discovered should be specifically treated. Smith and Norris found that if working girls know that provisions for their relief are available at work there is less absenteeism. Often this need be no more than a place to rest, a hot drink, a hot water bottle, and a mild analgesic. Further evidence of the psychic element in this disease was apparent in Arthure's [4] findings. Although he found that 69% of his series got relief by taking ambucetamide (dibutamide), 48% were relieved when a placebo was substituted. Chamblin and Corbit [6] also found that in those whose pain was only moderately severe a placebo and reassurance helped, but this type of help could not be relied on every month. He found that chlorpromazine could be substituted for codeine with equally satisfactory results and since chlorpromazine is not habit forming this was considered advantageous. The chlorpromazine was especially effective in those with tension, anxiety, and nausea. Because progesterone relaxes the uterus it has been tried but with generally poor results. Diethylstilbestrol is cheaper and much more effective; 1 mg. given every night for 15 days before the expected onset of menstruation suppresses ovulation but not menstruation. It has been shown that nonovulatory periods are painless and this may explain why in some patients menstrual periods are painful only every second month. If diethylstilbestrol produces undesirable side-effects, conjugated estrogenic substances, ethinyl estradiol, or promethestrol dipropionate may be tried.

If endocrine treatment fails a stem pessary used for two or three months may give relief lasting about a year, but such a course is rarely necessary. As a last resort in patients who are severely disabled by their cramps and who can obtain relief in no other way, Arthure recommends presacral neurectomy, first used for this purpose by Cotte.

---

[1] Smith, R. A. G., and Norris, B. M.: Dysmenorrhoea as Industrial Health Problem, Brit. J. Clin. Pract. **11**: 462-463 (June) 1957.

[2] Schmitz, H. E., and Isaacs, J. H.: Office Treatment of Primary Dysmenorrhea, M. Clin. North America, pp. 273-277, Jan., 1958.

[3] Golub, L. J.; Lang, W. R.; Menduke, H.; and Gordon, H. C.: *Teen-Age Dysmenorrhea:* Statistical Evaluation of Role of Suggestion in Treatment, Am. J. Obst. & Gynec. **74**:591-596 (Sept.) 1957.

[4] Arthure, H.: Spasmodic Dysmenorrhoea, Brit. J. Clin. Pract. **11**: 887-892 (Dec.) 1957.

[5] Greenhill, J. P.: Office Gynecology, ed. 6, Chicago, Year Book Publishers Inc., 1954.

[6] Chamblin, W. D., and Corbit, J. D. Jr.: Chlorpromazine and Chlorpromazine Combinations in Treatment of Dysmenorrhea, Am. J. Obst. & Gynec. **74**:419-421 (Aug.) 1957.

In his series 50% were permanently and completely cured and most of the rest were greatly improved. Division of the sympathetic nerves supplying the uterus may interrupt pain fibers, cut off the efferent motor fibers inducing the spasm, or cause vasodilatation in the uterus. Any of these factors could give relief. It would seem, therefore, that if the proper treatment is applied to the individual patient relief can be obtained unless an element of malingering is present. Although we cannot yet prevent dysmenorrhea we can alleviate suffering from this condition when it occurs.

NATIONAL MEDICAL-LEGAL CODE

The new National Interprofessional Code for Physicians and Attorneys appears on page 1663 of this issue of The Journal. It was adopted by the American Medical Association and the American Bar Association in June and August, respectively, at their Annual Meetings this year. This Code was prepared by the Joint A. M. A.–A. B. A. Liaison Committee after a study of interprofessional problems and after reviewing the numerous codes previously adopted by state and local bar and medical associations. The medical members of this Committee were Drs. David B. Allman of Atlantic City, N. J.; Hugh H. Hussey of Washington, D. C.; and George M. Fister of Ogden, Utah. The law members were Judge Frank C. Haymond of Charleston, W. Va.; Lewis C. Ryan of Syracuse, N. Y.; Joseph H. Gordon of Tacoma, Wash.; Fred B. Helms of Charlotte, N. C.; and Bernard G. Segal of Philadelphia.

The need for this National Code, which is intended as a guide for physicians and attorneys in areas where they have mutual interests and mutual problems, is obvious from the fact the from 65 to 80% of all cases tried today require medical testimony. In addition 7 out of 10 personal injury cases are decided on medical rather than legal considerations.

The first interprofessional code of record was promulgated by the bar association and medical society of Cincinnati in 1954. Since then over 25 state and county bar and medical associations have entered into similar agreements.

The National Code is very much like many of the state and county codes. It does, however, contain one section generally not found in previously adopted codes, namely, a section relating to the handling of a complaint or criticism by a member of one profession against the other. This section has been included because of the realization that the public airing of criticisms and complaints by members of one profession against the other neither improves interprofessional relations nor enhances either profession in the public's eye.

The adoption of this National Code is a milestone in the development of a better rapport between physicians and attorneys. It is now up to individual members of the profession to adhere to these rules of conduct. Such adherence will inevitably mean that the general public will be better served by the members of the legal and medical professions.

THE MINNEAPOLIS CLINICAL MEETING

The Clinical Meeting of the American Medical Association has established itself as one of the important medical meetings in the United States. The program, which formerly was geared specifically to the physician in general practice, has been broadened to include the interest of the specialist.

One of the features in Minneapolis will be 10 breakfast meetings at which topics of special interest to all physicians will be discussed under the direction of outstanding moderators. Physicians should obtain their tickets in the Registration Area in Minneapolis Auditorium as early in the week as possible, because attendance in each group is limited to 30 persons.

Lectures, panel discussions, symposiums, motion pictures, color television, and scientific exhibit demonstrations fill the daytime hours completely. Color television will originate at the University of Minnesota Hospital and will be shown each morning and afternoon in Minneapolis Auditorium. A Trans-Atlantic Conference on Chest Diseases will be one of the highlights of the meeting. Since the British Medical Association is holding its first clinical meeting at the same time as the A. M. A. Clinical Meeting, a two-way transoceanic telephone hookup is planned between a panel of American physicians in Minneapolis and a panel of British physicians in Southampton. The Scientific Exhibit will run continuously from 8:30 a. m. to 5:30 p. m. with demonstrators on duty to discuss their exhibits and to answer questions.

The history of medicine in Minnesota will be depicted in four booths, showing many interesting facts about early progress in medicine.

Demonstrations on the problems of delivery will include the use of a manikin. This feature will be presented at certain intervals during each day, and will offer an opportunity for questions and personal consultation with the demonstrators.

All scientific activities will take place in Minneapolis Auditorium with the exception of the breakfast round tables and the evening motion picture program.

The local committee has arranged interesting entertainment for Tuesday and Thursday evenings, while on Wednesday evening a film symposium on proctology for the general practitioner, with discussion by experienced proctologists, will be presented.

The local committee in Minneapolis, working with the Council on Scientific Assembly, has prepared an outstanding program which is a real contribution to graduate medical education.

ORGANIZATION SECTION

ESTIMATES OF COSTS FOR MILITARY CARE BY THE BUREAU OF THE BUDGET

June 27, 1958

William J. Kennard, M.D.
Acting Director
American Medical Association
Washington Office
1523 L Street, N. W.
Washington 5, D. C.

Dear Dr. Kennard:

This is in reply to your letter of June 17, 1958, requesting the Bureau of the Budget to furnish you the results of the survey made to bring up to date estimates of the costs of caring for military dependents in military hospitals which were furnished to you last year. I am glad to comply with this request, but it should be understood the data furnished herewith are based upon a somewhat limited coverage of costs in military hospitals and the application of informed judgment to the basic information.

On the basis of a detailed analysis of the proration of direct operating costs between care of dependents and other patients made at 14 representative military hospitals for the fiscal year 1957, it is concluded that the direct cost of dependent care averaged $31.58 per patient day.

The following items of indirect cost, averaging $8.38 per patient day, have been added in order to arrive at an approximation of the full cost to the Government of providing medical care to dependents in military hospitals. Depreciation of buildings and fixed equipment, $1.90; operating costs of central procurement and supply distribution system, $0.57; cost of education and training to increase proficiency of hospital personnel in patient care, $0.51; cost of headquarters staff management and professional direction incidental to inpatient care of dependents, $0.17; medical care of military personnel and their dependents, $1.06; retirement benefits of military personnel, $1.17; and outpatient care incidental to hospitalization of dependents, $3.00.

The combined direct and indirect costs result in a total estimated patient day cost for dependent care in fiscal year 1957 of $39.96. Of this amount, $34.46 represents the cost of hospital care and $5.50 approximates the cost of staff physician's services. To reflect current costs, it is necessary to add to this 1957 experience the increased operating expenses incurred in fiscal year 1958 plus the cost of the recently granted pay increases for military and civilian personnel. These items are estimated to be $2.00 and $1.71 per patient day respectively. The total current cost for care of dependents in military hospitals, therefore, is estimated to be $43.67, comprising $38.05 for hospital care and $5.62 for staff physician's services.

Sincerely yours,
Roger W. Jones
Assistant Director

ANIMAL CARE MEETING

Better care for research animals means greater accuracy in scientific findings. This is the idea underlying the Animal Care Panel whose ninth annual session will be held at the Hamilton Hotel, in Chicago, Dec. 3-5. The panel is a volunteer organization and has no staff. Its efforts are aided by the National Society for Medical Research, which publishes its proceedings. Sessions are devoted to the exchange of technical information offered by scientists and laboratory animal superintendents on matters of colony management.

Areas of discussion to be covered during the three-day meeting will include the following: techniques and equipment in maintaining germ and pathogen-free colonies; design of animal quarters and temperature control; management of sanitation and nutrition; and diagnosis of diseases in laboratory colonies.

MINNEAPOLIS CLINICAL MEETING

One of the features of the Minneapolis Clinical Meeting will be 10 breakfast round tables on Thursday morning, Dec. 4, on subjects of paramount interest in the practice of medicine. Attendance at each round table will be limited to 30 persons. Tickets will be available at $2.50 each, as long as the supply lasts, in the Registration Area at the Minneapolis Auditorium, beginning Tuesday morning. Physicians are urged to purchase their tickets as early in the week as possible.

Breakfast begins at 7:30 a. m. and the conference terminates at 8:45 a. m. allowing time to reach the Auditorium for the program there.

The subjects to be discussed at each breakfast, the moderators, and the place are as follows:

Obstetric Emergencies.
  Roy G. Holly, Omaha.
    Leamington Hotel, Indiana Room.
Problem of Management of Severe Sepsis.
  Wesley W. Spink, Minneapolis.
    Leamington Hotel, Michigan Room.

Orthopedic Problems in General Practice.
John F. Lyford III, Hines, Ill.
Leamington Hotel, Chicago Room.
Common Problems in Managing the Arthritic Patient.
John W. Sigler, Detroit.
Leamington Hotel, Twin Cities Room.
Cancer Detection in the Doctor's Office.
David P. Anderson Jr., Austin, Minn.
Curtis Hotel, Moroccan Room.
Management of Jaundice and Liver Disease.
Cecil J. Watson, Minneapolis.
Curtis Hotel, Mirror Room.
Acute Poisonings.
Robert D. Semsch and Warren R. Lawson, Minneapolis.
Curtis Hotel, Solarium Room.
Current Trends in Legal Medicine.
Raymond A. Scallen, Minneapolis.
Curtis Hotel, Evergreen Room.
Infant Resuscitation.
Ellis N. Cohen, St. Paul.
Curtis Hotel, East Room.
The Practitioner and the Medical School.
Walter S. Wiggins, Chicago.
Curtis Hotel, Vermilion Room.

SUMMARY REPORT ON HEALTH AND INSURANCE PLANS UNDER COLLECTIVE BARGAINING

What types of health benefits are being negotiated under collective bargaining agreements? What is the extent of coverage under such agreements? What appears to be the future trend in the negotiation of such agreements? What are some of the gaps of coverage as reported by a recent government study? The answers to these and other questions which have been raised by physicians can be found in a new publication just issued by the Committee on Medical Care for Industrial Workers of the Council on Medical Service and Council on Industrial Health. The publication, entitled "A Summary Report on Health and Insurance Plans Under Collective Bargaining, Late 1955" is based on a report (Bulletin no. 1221) issued by the Bureau of Labor Statistics of the United States Department of Labor which analyzes the provisions of 300 collectively bargained plans as they existed in the latter part of 1955.

The committee of the A. M. A. considered the information in the detailed 87-page Department of Labor report of sufficient interest to physicians and medical societies to summarize its contents and to report on various highlights of the findings. The 300 plans which were selected for inclusion in the study by the Bureau of Labor Statistics are described as broadly representative, covering groups of employees ranging from 1,000 to half a million. The plans embraced almost 5 million workers, or over 40% of the total number of employees estimated to be covered by health and insurance plans under collective bargaining at the time of the survey. The number of dependents covered by these plans are estimated by the committee to be equal, at least, to the number of wage earners enrolled in these plans.

The types of benefits included in the study were: life insurance, accidental death and dismemberment, accident and sickness, surgical, and medical care. Sections of the report also deal with maternity and related benefits, major medical, poliomyelitis, and outpatient x-ray and laboratory expense benefits. The Summary Report has numerous tables which have been adapted from the survey of the government agency and which indicate the types of analyses and breakdowns which the original report contains. Single copies of the Summary Report are available upon request, without charge, from the Committee on Medical Care for Industrial Workers.

DR. W. W. BAUER RECEIVES SCHOOL HEALTH AWARD

The American School Health Association, at its annual meeting in St. Louis, Oct. 29, will present the William A. Howe Honor Award to Dr. W. W. Bauer, for many years' service as director of the Bureau of Health Education of the American Medical Association. According to the School Health Association, Dr. Bauer's greatest contribution has been the initiation and development of the National Conference on Physicians and Schools, a means of betterment of the health of the children and youth of America.

MEDICINE AND THE LAW

NATIONAL INTERPROFESSIONAL CODE FOR PHYSICIANS AND ATTORNEYS

Preamble

The provisions of this Code are intended as guides for physicians and attorneys in their interrelated practice in the areas covered by its provisions. They are not laws, but suggested rules of conduct for members of the two professions, subject to the principles of medical and legal ethics and the rules of law prescribed for their individual conduct.

This Code constitutes the recognition that, with the growing interrelationship of medicine and law, it is inevitable that physicians and attorneys will be drawn into steadily increasing association. It will serve its purpose if it promotes the public welfare, improves the practical working relationships of the two professions, and facilitates the administration of justice.

The National Inter-Professional Code for Physicians and Attorneys was adopted by the American Medical Association at its Annual Meeting on June 26, 1958, and by the American Bar Association at its Annual Meeting on Aug. 28, 1958.

Medical Reports

The physicians upon proper authorization should promptly furnish the attorney with a complete medical report, and should realize that delays in providing medical information may prejudice the opportunity of the patient to either settle his claim or suit, delay the trial of a case, or cause additional expense or the loss of important testimony.

The attorney should give the physician reasonable notice of the need for a report and clearly specify the medical information which he seeks.

Conferences

It is the duty of each profession to present fairly and adequately the medical information involved in legal controversies. To that end the practice of discussion in advance of the trial between the physician and the attorney is encouraged and recommended. Such discussion should be had in all instances unless it is mutually agreed that it is unnecessary.

Conferences should be held at a time and place mutually convenient to the parties. The attorney and the physician should fully disclose and discuss the medical information involved in the controversy.

Subpoena for Medical Witness

Because of conditions in a particular case or jurisdiction or because of the necessity for protecting himself or his client, the attorney is sometimes required to subpoena the physician as a witness. Although the physician should not take offense at being subpoenaed the attorney should not cause the subpoena to be issued without prior notification to the physician. The duty of the physician is the same as that of any other person to respond to judicial process.

Arrangements for Court Appearances

While it is recognized that the conduct of the business of the courts cannot depend upon the convenience of litigants, lawyers, or witnesses, arrangements can and should be made for the attendance of the physician as a witness which take into consideration the professional demands upon his time. Such arrangements contemplate reasonable notice to the physician of the intention to call him as a witness and to advise him by telephone, after the trial has commenced, of the approximate time of his required attendance. The attorney should make every effort to conserve the time of the physician.

Physician Called as Witness

The attorney and the physician should treat one another with dignity and respect in the courtroom. The physician should testify solely as to the medical facts in the case and should frankly state his medical opinion. He should never be an advocate and should realize that his testimony is intended to enlighten rather than to impress or prejudice the court or the jury.

It is improper for the attorney to abuse a medical witness or to seek to influence his medical opinion. Established rules of evidence afford ample opportunity to test the qualifications, competence, and credibility of a medical witness; and it is always improper and unnecessary for the attorney to embarrass or harass the physician.

Fees for Services of Physician Relative to Litigation

The physician is entitled to reasonable compensation for time spent in conferences, in preparation of medical reports, and in court or other appearances. These are proper and necessary items of expense in litigation involving medical questions. The amount of the physician's fee should never be contingent upon the outcome of the case or the amount of damages awarded.

Payment of Medical Fees

The attorney should do everything possible to assure payment for services rendered by the physician for himself or his client. When the physician has not been fully paid the attorney should request permission of the patient to pay the physician from any recovery which the attorney may receive in behalf of the patient.

Implementation of This Code at State and Local Levels

In the event similar action has not already been taken this Code should, in the public interest, be appropriately implemented at state and local levels for the purpose of improving the interprofessional relationship between the legal and medical professions.

Consideration and Disposition of Complaints

The public airing of any complaint or criticism by a member of one profession against the other profession or any of its members is to be deplored. Such complaints or criticism, including complaints of the violation of the principles of this Code, should be referred by the complaining doctor or lawyer through his own association to the appropriate association of the other profession; and all such complaints or criticism should be promptly and adequately processed by the association receiving them.

MEDICAL NEWS

ALABAMA

Alumni Medical Program.—The first general medical program for alumni and friends of the Alabama Medical Center will be presented by the clinical faculty of the Medical College of Alabama, Birmingham, Nov. 28-29 with the scientific sessions held at the University Hospital Auditorium. University President Frank A. Rose will open the meeting with an address followed by seminars directed by Dr. J. Henry Goode, president, Medical Alumni Association of Alabama. The clinical seminar will include presentations in surgery, obstetrics and gynecology, psychiatry, medicine, and pediatrics. The morning of Nov. 29 will be devoted to a medical and surgical conference and a clinical pathological conference. There is no registration fee and the meeting has been classified for category I credits by the Alabama Academy of General Practice.

Personal.—Howard E. Skipper, Ph.D., assistant director, Southern Research Institute, Birmingham, has been appointed a member of the National Advisory Cancer Council, Surgeon General Leroy E. Burney of the U. S. Public Health Service, has announced.

ALASKA

Alaskan Health Statistics.—Statisticians of the Metropolitan Life Insurance Company have reported that between 1947 and 1957 the recorded mortality rate in the white population of Alaska decreased from 8.7 to 4.6 per 1,000, and among the nonwhites from 15.2 to 10.7 per 1,000. The recorded death rate from tuberculosis fell more than 80% between 1947 and 1957 in both the white and nonwhite populations. Actual decreases in the death rate were from 28.8 to 4.7 per 100,000 among white persons and from 574.3 to 88.4 among nonwhites. Infant mortality also showed a downward trend. Accidents was first among the causes of death in Alaska in 1957, accounting for nearly one-fifth of the total deaths. Heart disease was a close second, and diseases of early infancy ranked third, reflecting in part the high birth rate in Alaska, the statisticians report. Cancer, and influenza and pneumonia combined, were next in rank.

CALIFORNIA

Annual Lecture to Honor Volunteer Physicians.—The second annual lecture honoring the Volunteer Medical Staff of the Sacramento County Hospital, sponsored by the Sacramento County Board of Supervisors, will be given by Fred L. Soper, director, Pan American Sanitary Bureau, Regional Office of the World Health Organization, on "The Role of the World Health Organization in Disease Eradication" at the Kit Carson Junior High School Auditorium Dec. 4, 8:30 p. m. The first lecture was given by Dr. Paul D. White last January. The Board of Supervisors plan to continue to sponsor an annual lecture in honor of volunteer physicians who contribute to the care of the medically indigent of the community.

COLORADO

Poison Control Center in Denver.—The only full-fledged Poison Control Center in Colorado is at the *Denver General Hospital, Telephone Tabor 5-1331.* This center, under the direction of Dr. Robert S. Johnson, functions on a 24-hour basis furnishing consultative service, supervision of emergency treatment, and public education concerning accidental poisoning. It has excellent toxicological laboratory facilities. The center was organized by the pediatrics department of the University of Colorado Medical Center and placed at Denver General Hospital by reason of availability of personnel, funds and facilities. The Colorado State Department of Public Health serves as liaison between the present center and local health departments, contributes financially to its operation, and works with it in educational and preventive activities. The establishment of other Poison Control Centers or Poison Information Centers in the state is contemplated.

CONNECTICUT

Dedicate Radiation Therapy Center.—The new $1,165,000 Hunter Radiation Therapy Center for research and treatment of cancer and other diseases was dedicated at the Yale–New Haven Medical Center, New Haven, Oct. 10. A two-million electron volt Van de Graaff x-ray generator, a gift of the Donner Foundation of Philadelphia, will be housed in the structure, which will serve both Grace–New Haven Community Hospital and the Yale School of Medicine. The guest speaker at the dedication was Dr. Lee E. Farr, director, Medical

---

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

Institute of Brookhaven National Laboratory. The radiation therapy center and the tumor clinic will occupy the first two floors while the top two floors will provide laboratory space for the pediatrics and medicine departments of the Yale Medical School. The center is named in memory of the family of Robert E. Hunter, of Santa Barbara, Calif., of the Yale Class of 1911, who made a gift to Yale for the new building, which is on Davenport Avenue with connecting corridors to other hospital units. The main floor will also house waiting, examining, and dressing rooms, laboratories, and a workshop. The Tumor Clinic is on the street floor. Also housed in the building will be the Tumor Registry which has some 5,000 patients registered.

FLORIDA

New Departmental Chairman.—Dr. Richard T. Smith has been selected as professor and chairman of the department of pediatrics at the University of Florida College of Medicine in Gainesville, effective Sept. 1. Hospital facilities available to the new department include 75 pediatric beds and nursery facilities for about 2,000 deliveries a year. In addition to an active out-patient department, there is an ambulant division where mothers and their children may remain together. Applicants are now being received for pediatric internships and residencies to begin Jan. 1 and July 1, 1959. Inquiries may be addressed to the Department of Pediatrics, College of Medicine, University of Florida, Gainesville, Fla.

University News.—Grants totaling $23,000 have been awarded two units of the University of Florida's J. Hillis Miller Health Center. The Atomic Energy Committee granted the College of Medicine $15,000 and the College of Pharmacy $8,000 to purchase equipment for the instruction of medical and pharmacy students in radioisotopic tracer techniques.

INDIANA

Two New University Divisions.—Dr. Walter D. Close and Dr. A. David McKinley have been made head of two new educational divisions in the Indiana University School of Medicine. Dr. Close will be in charge of an expanded medical education program for physicians serving residencies and internships on the staffs of the university hospitals and in that capacity will serve as medical director for the Long, Coleman, and Riley hospitals at the Indiana University Medical Center. Dr. McKinley will develop and direct an audiovisual aids program, assembling material for teaching and other educational activities. In addition, Dr. McKinley will supervise the operation of the Heart Station and will resume the teaching assignments in cardiology which he had given up while serving as medical director of the hospitals.

MARYLAND

Dr. Thorn Named Pincoffs Lecturer.—The second Maurice C. Pincoffs Lecture in Internal Medicine will be given at the University of Maryland School of Medicine and College of Physicians and Surgeons by Dr. George W. Thorn, Hersey Professor of Medicine at the Peter Bent Brigham Hospital, Boston. His topic will be "Adrenal Hyperfunction—Clinical Studies." The lecture in Chemical Hall will begin at 8:30 p. m., Dec. 15. The Pincoffs lectureship in medicine was established in 1957 by the faculty in honor of Dr. Pincoffs' 35 years as professor of medicine. Funds contributed by faculty, colleagues, friends, and former students made its establishment possible.

MASSACHUSETTS

Dr. Friedkin Comes to Boston.—Morris E. Friedkin, Ph.D., associate professor of pharmacology at the Washington University School of Medicine, St. Louis, has been appointed professor and chairman of the department of pharmacology at the Tufts University School of Medicine, Boston. He will succeed Byron B. Clark, Ph.D., who has resigned after 10 years to join a midwestern pharmaceutical firm.

NEW YORK

Dr. Fenn Honored.—Wallace O. Fenn, Ph.D., professor of physiology, University of Rochester School of Medicine and Dentistry, and the only member of the school's original advisory board still serving in that capacity, was awarded the Gold Medal of the Medical Alumni Association at the organization's banquet. The medal is awarded each year to a faculty member "in recognition of his integrity, inspiring teaching, and devotion to medical students."

Society News.—The Northeastern New York Radiological Society has elected the following officers for the coming year: president, Kencil L. Mitton, Schenectady, New York; vice president, Sidney I. Etkin, Albany, New York; and secretary-treasurer, Irving Van Woert Jr., Albany, New York.

Multiple Birth Roster.—The New York City Department of Health has established a "Multiple Birth Roster," intended to be a source of information for research workers in genetics, child development, and other fields. All the identifying, demographic, and pregnancy information available on the birth certificate of each infant is punched on a tabulating card. The roster will be kept up-to-date in three respects: adoption of a child, death during the first year of life, and data fed back to the roster by the individual researcher. The roster was initiated as of Jan. 1, 1958. At a later date an evaluation will be made to determine whether its use by researchers warrants its continuation. Formal requests should be submitted to Dr. Harold Jacobziner, Assistant Commissioner for Maternal and Child Health Services, New York City Department of Health, 125 Worth St., New York 13.

New York City

Appoint Chairman for New Department.—Dr. Joseph G. Benton has been appointed chairman of the newly established department of rehabilitation medicine at the State University of New York Downstate Medical Center and director of the rehabilitation department in Kings County Hospital Center, both in Brooklyn. Dr. Benton had been associated with the Institute of Physical Medicine and Rehabilitation of the New York University–Bellevue Medical Center since 1948, and was also associate professor of clinical physical medicine and rehabilitation at New York University College of Medicine.

President's Committee Award Citation to Dr. Weeden.—The President's Committee on Employment of the Physically Handicapped has awarded a special citation to Dr. Willis M. Weeden, medical director of the New York State Workmen's Compensation Board, in appreciation of his "exceptional contributions in advancing the employment of the physically handicapped." The citation was presented to Dr. Weeden by Dr. Gerald D. Dorman, New York City, chairman of the Council Committee on Workmen's Compensation of the Medical Society of the State of New York, at the Statler Hotel during a luncheon. Dr. Weeden has been medical director of the Workmen's Compensation Board for 12 years. He is a consulting surgeon at the Elmhurst General Hospital, Queens, is on the surgical staff of the New York Hospital, and is an instructor in surgery at Cornell University Medical College.

Program for Municipal Health Research.—A "purely municipal program of medical and health research" was launched Sept. 16 by Mayor Robert F. Wagner at a meeting of more than 300 of the city's scientists, civic leaders, and medical experts. The newly inaugurated New York City Health Research Council will direct the research program. Dr. Walsh McDermott, Professor of Public Health and Preventive Medicine, Cornell University Medical College, is chairman of the council. A specially created Office of Health Research within the Health Department will administer the program, and Dr. Colin MacLeod, former chairman of the Army Epidemiology Board, will head this new unit. The city has appropriated $600,000 to underwrite the first year's work. The funds will be allocated under the guidance of the Research Council and will enable scientists in local medical schools, hospitals, universities, research institutions and city departments to carry on and intensify research work on a wide range of health and medical problems.

PENNSYLVANIA

Philadelphia

Personal.—Dr. Thomas Gucker III, assistant professor of orthopedic surgery, University of Pennsylvania School of Medicine and assistant orthopedic surgeon at Georgia Warm Springs Foundation, has been appointed physician in charge of Orthopaedic Hospital's rehabilitation center in Los Angeles.——Dr. Elmer Hess, of Erie, past-president of the American Medical Association, was guest of honor at the annual dinner meeting Oct. 16 of the medical alumni society of the University of Pennsylvania. Dr. Hess is a graduate of the University of Pennsylvania School of Medicine.

TENNESSEE

Organize Research Center in Knoxville.—A new research installation, the University of Tennessee Memorial Research Center, has begun operation on the university campus in Knoxville. Housed in a 6-million-dollar building which also contains a 384-bed general hospital, the center is being organized by Dr. Stanfield Rogers, who left the Duke University Medical Faculty at Durham, N. C., last January to assume directorship of the new installation. Dr. Rogers was assisted setting up the research laboratories by Guy Thomas Barry, Ph.D., who is working in the fields of biochemistry and microbiology. The Research Center has facilities for the use of radioactive isotopes from nearby Oak Ridge. In addition to research, this institution is working cooperatively with the Biology Division of the Oak Ridge National Laboratory in Oak Ridge. It is also working cooperatively in the training of postdoctoral fellows with the medical school of the University of Tennessee College of Medicine, in Memphis. Since the opening of the Research Center, three other scientists have been added to the staff: Dr. Amoz I. Chernoff, from Duke University School of Medicine, Dr. Bernard G. Stall, III, University of North Carolina School of Medicine, Chapel Hill, and Dr. McChesney Goodall Jr., from Duke University.

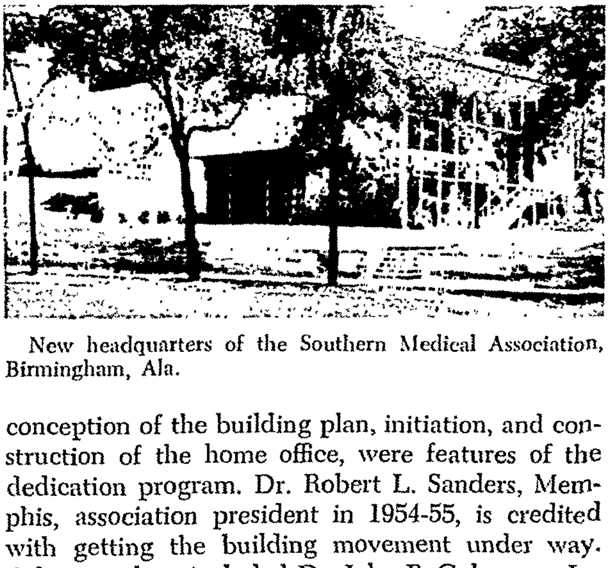
Society News.—The Tennessee Radiological Society has elected the following officers: president, 1958, Dr. David S. Carroll, Memphis; president-elect, Dr. Granville W. Hudson, Nashville; vice-president, Dr. George K. Henshall, Jr., Chattanooga; and secretary-treasurer, Dr. James J. Range, Johnson City.

TEXAS

Foreign Guest Speakers.—Baylor University College of Medicine, Houston, had Dr. John F. Loutit, director, Radiobiological Research Unit, Atomic Energy Research Establishment of Harwell, England, as its guest Oct. 31. He spoke on "Lessons in Physiology from Radiation Chimaeras." Dr. Michael G. P. Stoker of the department of pathology, Cambridge University, England, spoke before the weekly seminar of the Texas Medical Center Research Society Nov. 5 on "Studies on Growth and Latency with Herpes Virus." Dr. William H. McMenemey, of Maidavale Hospital, London, England, lectured to sophomore students Nov. 10.

GENERAL

Southern Medical Association Opens New Headquarters.—Formal opening of the new $250,000 home of the Southern Medical Association in Birmingham, Ala., Sept. 7, marked the completion of several years of planning and more than one year of construction. Association president is Dr. W. Kelly West, Oklahoma City. Remarks by past-presidents whose administrations coincided with the conception of the building plan, initiation, and construction of the home office, were features of the dedication program. Dr. Robert L. Sanders, Memphis, association president in 1954-55, is credited with getting the building movement under way. Other speakers included Dr. John P. Culpepper Jr., Hattiesburg, Miss., Dr. Lee F. Turlington, Birmingham, V. O. Foster, executive director, and Mrs. Walker L. Curtis, College Park, Ga., president of the Southern Medical Association Woman's Auxiliary. Dr. Arthur C. McCarty, past-chairman of the Southern Medical Association Council, made the official presentation of a portrait of C. P. Loranz, who has served the organization as professional relations director for 46 years and who led the building fund drive. Presiding was Dr. Milford O. Rouse, Dallas, president-elect of the association. The new building is a split-level structure fronting on Highland Avenue at 26th Street South. In addition to providing a meeting place and business center, a library-conference room, Woman's Auxiliary headquarters, and other work areas, it contains space for the monthly *Southern Medical Journal.* The Southern Medical Association, which now has 13,000 members, has maintained headquarters in Birmingham for 43 of its 52 years. It was founded in Chattanooga in 1906 and offices were in Mobile before being moved to Birmingham in 1913.


New headquarters of the Southern Medical Association, Birmingham, Ala.

Support for Undergraduate Research.—The National Science Foundation has announced plans to make grants to colleges, universities, and nonprofit research institutions to provide opportunities for qualified undergraduates majoring in the physical, biological, mathematical, and engineering sciences. About 1,000 undergraduates at some 100 institutions are expected to participate in these programs. The foundation will provide support, in accordance with prevailing campus practices, for a maximum of 400 hours per student. Details for preparing proposals may be obtained from the Special Projects in Science Education Section, National Science Foundation, Washington 25, D. C.

National Health Council Elects New Member.—The American College of Preventive Medicine has been elected to active membership in the National Health Council, bringing to 63 the number of organizations comprising the National Health Council. Its membership consists of voluntary and governmental health agencies, professional associations, civic groups, and business firms having a major interest in health. The council serves as a conference ground for these organizations to plan together for the better health of the nation. President of the American College of Preventive Medicine is Dr. Vivian A. Van Volkenburgh, assistant commissioner of the New York State Department of Health, Division of Local Health Services. Among the chief aims of the association are "the promotion and advancement of the highest possible service standards in education, practice, and research in preventive medicine and public health."

Fellowships for Women.—The American Association of University Women has announced a total of 40 fellowships for 1958-1959, open to American women who show "distinction or promise of distinction in their chosen fields of study." The two categories are (1) women who already hold the doctorate and (2) women who have fulfilled all doctorate requirements, except the dissertation. The association also offers international fellowships, $2,000 each, for which American women may apply. Both national and international fellowships are unrestricted as to field and place of study except that the international fellowships must be used in a country other than the candidates own. Candidates must have completed the residence requirements for the doctorate before the fellowship year begins

July 1, 1959. Requests for application forms must include a statement of academic status. Application deadline is Dec. 1 and successful candidates will be notified by March 1, 1959. Application forms may be obtained from Associate, AAUW Fellowship Program, 1634 Eye St., N. W., Washington 6, D. C.

Society News.—At the 15th annual meeting of the **American Medical Writers' Association** the following officers were elected to serve for 1959: president-elect, Dr. Austin E. Smith, Chicago; first vice-president, Dr. Karl A. Menninger, Topeka, Kan.; second vice-president, Dr. Theodore R. Van Dellen, Chicago; editor, Dr. Raymond C. Pogge, Cincinnati (reelected); accounting officer, Dr. Alphonse McMahon, St. Louis (reelected); and secretary-treasurer, Dr. Harold Swanberg, Quincy, Ill. (reelected).——The **American Academy of Ophthalmology and Otolaryngology**, at its annual meeting in Chicago Oct. 16, elected Dr. Dean M. Lierle, of the State University of Iowa College of Medicine, Iowa City, president-elect, to take office in January, 1960, succeeding Dr. John H. Dunnington, New York, who is now president-elect and will become president in January, 1959. The vice-presidents elected were Drs. Gordon Hoople, Syracuse, N. Y.; S. Rodman Irvine, Beverly Hills, Calif.; and Lyle M. Sellers, Dallas, Texas. The next annual meeting will also be held in Chicago.

Bahamas Medical Conference.—The sixth Bahamas Medical Conference will be held at the British Colonial Hotel, Nassau, Nov. 28-Dec. 18. Among the speakers are:

During the first week: Drs. Charles H. Brown, Cleveland; James F. Dowd, Robert Dean Woolsey, St. Louis; Edward D. Freis, Washington, D. C.; Richard A. Dunsmore, Lillian D. Dunsmore, George E. Farrar Jr., Richard F. Tislow, Philadelphia; James R. Fitzsimmons, Detroit; Alice I. Macaulay, Valhalla, N. Y.; James H. Mendel Jr., Miami; George W. Thorn, Kendall Emerson, Ross A. MacFarland, Ph.D., Boston.

During the second week: William B. Castle, Boston; Helen F. Dunbar, New York; Richard K. Greenbank, Philadelphia; Meyer Solomon, Chicago; Joseph F. Fazekas, Washington, D. C.; E. Perry McCullagh, Cleveland; I. Arthur Mirsky, Pittsburgh; John C. Saunders, Orangeborg, N. Y.; Charles Weller, Valhalla, N. Y.; Henry A. Zimmerman, Cleveland.

During the third week: Robert B. Greenblatt, Augusta, Ga.; Irving Hirshleifer, Felix Wroblewski, New York; Marvin J. Seven, Lawrence E. Meltzer, Philadelphia.

The American Medical Association is making available six films for showing at the conference. Participants and their parties enjoy special reduced hotel rates at the British Colonial Hotel in Nassau, provided that reservations are made by writing directly to "Bahamas Conferences," P. O. Box 4037, Fort Lauderdale, Fla. Reservations should be made at once. If reservations are made by telephone, call JAckson 3-7303 at Fort Lauderdale, Fla. Indicate the type of accommodation required.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

	Oct. 25, 1958		Oct. 26, 1957,
Area	Paralytic Type	Total Cases	Total
New England States			
Maine	2	2	1
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	2	2	..
Middle Atlantic States			
New York	8	16	4
New Jersey	7	10	..
Pennsylvania	2	2	3
East North Central States			
Ohio	6	16	6
Indiana	1	8	8
Illinois	7	9	4
Michigan	20	57	5
Wisconsin	2	2	2
West North Central States			
Minnesota	1	1	1
Iowa	..	..	1
Missouri	16	19	3
North Dakota	..	..	..
South Dakota	..	1	..
Nebraska	..	2	..
Kansas	..	..	2
South Atlantic States			
Delaware	1	1	..
Maryland	2	2	4
District of Columbia	..	..	5
Virginia	4	4	2
West Virginia	7	10	2
North Carolina	4	4	5
South Carolina	1	1	2
Georgia	5	11	4
Florida	1	1	4
East South Central States			
Kentucky	4	5	3
Tennessee	..	2	5
Alabama	1	3	..
Mississippi	3	3	1
West South Central States			
Arkansas	3	3	..
Louisiana	3	4	1
Oklahoma	1	1	1
Texas	27	30	7
Mountain States			
Montana	..	..	..
Idaho	..	..	..
Wyoming	..	1	..
Colorado	..	..	..
New Mexico	..	..	..
Arizona	1	6	2
Utah	..	..	..
Nevada	1	1	..
Pacific States			
Washington	..	..	..
Oregon	1	1	4
California	11	12	20
Alaska	..	..	..
Hawaii	2	2	..
Puerto Rico	..	..	..
Total	157	255	112

LATIN AMERICA

Dr. Leloir of Buenos Aires Receives Award.—The Helen Hay Whitney Foundation, 525 E. 68th St., New York City, announces that Dr. Luis F. Leloir, director, Instituto de Investigaciones Bioquimicas, Buenos Aires, Argentina, has been selected as the first recipient of the T. Duckett Jones Memorial Award, in recognition of his work on the isolation of uridine diphosphoglucose, and other derivatives of uridine, from plant and animal tissues. This award, which will be an annual presentation by the foundation, was made possible by the income from the T. Duckett Jones Memorial Fund, plus an equal amount from the Helen Hay Whitney Foundation, of which Dr. Jones was medical director at the time of his death. The recipients of this award ($6,500) will be chosen each year by the Scientific Advisory Committee of the foundation "for outstanding achievement in the medical field or related sciences."

CORRECTION

Preventing Blood Coagulation.—In the Question and Answer entitled "Preventing Blood Coagulation," in The Journal, Aug. 2, 1958, page 1806, it was stated that 1 mg. is equal to 10 units. This should have read 1 mg. is equal to 100 units.

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Oral.* Phoenix, April 5-10. All applications already on file. Sec., Dr. Forrest E. Leffingwell, 217 Farmington Ave., Hartford 5, Conn.

American Board of Dermatology: *Written.* Several Cities, Oct. 5. *Oral.* Oklahoma City, Jan. 15-18, 1960. Sec., Dr. Beatrice M. Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *1959 Schedule—Written,* Oct. 19. Final date for filing application is May 1. *Oral.* For candidates in the South and Southwest, New Orleans, Feb. 3-6. Final date for filing application is Jan. 1. *Oral.* For candidates in the Midwest. Chicago, April 15-18. Final date for filing application is Jan. 1. *Oral.* For candidates on the West Coast. Final date for filing application is March 1. *Oral.* For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology.* Philadelphia, April 17-18. Final date for filing application is Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: *Part I.* Various parts of the United States and Canada, January 16. Candidates notified of their eligibility to participate in Part I must submit their case abstracts within thirty days of notification of eligibility. No candidate may take the written examination unless the case abstracts have been received in the office of the Secretary. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), Various Cities, Jan. 26. *Oral.* Philadelphia, June 3-6. Sec., Dr. Merrill J. King, 22 White St., Rockland, Maine.

American Board of Orthopaedic Surgery: *Part I.* Washington, D. C., Denver, Colorado and Rochester, Minn., Mar. 26-27. Deadline for filing application is Nov. 30. *Part II.* Chicago, Jan. 21-23, 1959. Deadline for receipt of applications was Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 5-9. Final date for filing application is February. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pediatrics: *Oral.* New York, Dec. 5-7. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Physical Medicine and Rehabilitation: *Written, Part I,* and *Oral, Part II.* Philadelphia, *June 12-13. Final date for filing application* is February 15. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

American Board of Plastic Surgery: *Oral and Written.* Boston, May 9-11. Final date for submitting case reports i Jan. 1. Corresponding Secretary, Miss Estelle E. Hillerich 4647 Pershing Ave., St. Louis 8, Mo.

American Board of Preventive Medicine: *Written. Publi Health.* Regional, Apr. 9-11. *Occupational Medicine.* Chicago, Apr. 17-19. *Aviation Medicine.* Los Angeles, Apr 24-26. Final date for filing application for all three examinations is Jan. 15. Sec., Dr. Tom F. Whayne, 343 Walnut St., Philadelphia 4.

American Board of Proctology: *Oral and Written.* Philadelphia, September. Final date for filing application i March. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garde City, N. Y.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Trainin credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services betwee the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-11 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Regular Examination* Washington, D. C., Dec. 8-11. Final date for filing application was July 1. *Special examination in Nuclear Medicine for those diplomates in Radiology or Therapeutic Radiology.* Washington, D. C., Dec. 6. Final date for filing application was Oct. 1. *Special Examination.* Cincinnati Mar. 16-19, 1959. Final date for filing application is Nov. 1. Candidates completing training June 30, 1959 are not eligible for the Spring 1959 examinations. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: Written examinations (Part I) will be held at various centers in the United States, Canada, Hawaii, Puerto Rico, and certain military centers abroad on December 3. The date of the Fall examination in *Part I* has been changed from the last Wednesday of October as announced in its current Booklet of Information to December 3, 1958. Thereafter, examinations in Part I will be held once annually, on the first Wednesday of December. The closing date for filing applications was August 1. *Part II.* New York City, Dec. 15-16; Houston, Tex., Jan. 12-13; New Haven, Conn., Feb. 9-10; Durham, No. Car., March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: *Oral.* Los Angeles, April. Final date for filing application is Dec. 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

American Board of Urology: *Written Examination.* Twenty-five cities throughout the country, *Dec. 5. The oral* will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

GOVERNMENT SERVICES

NAVY

Medical Corps Retirements.—The following medical corps officers were placed on the retired list on Oct. 1, by reasons of voluntary retirement: Capt. John D. Walters, after more than 20 years active duty, and Capt. Jesse G. Wright, after more than 30 years active duty.

The following medical corps officers were placed on the retired list on Oct. 1, by reasons of reaching the statutory age of retirement: Capt. Wilbur E. Kellum, after more than 30 years active service, and Capt. Carl H. McMillan, after completing more than 30 years active service. (Captain Kellum was advanced on the retired list to the rank of Commodore.

The following medical corps officer was placed on the temporary disability retired list of the Navy on Oct. 1: Capt. Harold G. Young, after more than 31 years active service. (Captain Young will be advanced on the retired list to the rank of Rear Admiral.)

New Navy Hospital at Portsmouth, Va.—A ceremony was held Oct. 17, at the laying of the cornerstone of the new 15-story naval hospital being constructed in Portsmouth, Va. The hospital, which is expected to be completed in December, 1959, will have 800 beds, with supporting services capable of accommodating a 700-bed extension. This hospital provides the medical support for military personnel and their authorized dependents in the Norfolk-Portsmouth-Hampton Roads area of Tidewater, Va. Among other things it will have such innovations as radio-electronic paging for doctors and provisions for closed circuit television in surgical suites. The history of the Portsmouth Hospital dates back to 1830 when it was built. Today, the staff and employees of the hospital total about 1,240 persons. The new hospital will be one of the finest examples of architecture in the country. The principle address during the cornerstone laying was given by the Hon. Porter Hardy Jr., U. S. Congressman from the Second District of the state of Virginia.

VETERANS ADMINISTRATION

Personal.—Dr. Horace B. Cupp, director, VA area medical office in Atlanta, Ga., has been appointed deputy for operations of VA hospitals, outpatient clinics, and homes.

Dr. Lee H. Schlesinger, manager of the West Side VA hospital in Chicago, has been named area medical director in the Columbus, Ohio, area medical office of the VA, succeeding Dr. John G. Hood, who is being transferred to Atlanta, Ga., as area medical director.

Dr. Irvin J. Cohen, director of hospitals and clinics for VA in Washington since 1955, has been appointed to a newly created position as deputy to the assistant chief medical director for professional services in Washington, D. C.

PUBLIC HEALTH SERVICE

Increase in Grants in Mental Health Field.—A marked increase in grants to increase the supply of workers in the mental health field has been reported by Dr. Robert Felix, director, National Institutes of Mental Health. Grants to date in this fiscal year total over 16 million dollars. Grants have been made for the first time to support training of research-oriented psychologists at the doctoral level. Training emphasis will be on child development as well as physiological and social development in the human personality.

Under continuing programs to support training for mental health clinical specialists, 53 new grants were awarded this year. A total of 2,385 persons are now receiving training under these programs. They are being trained as psychiatrists, psychologists, social workers, psychiatric nurses, and public health nurses. Twelve new grants totalling $134,366 were made this year to collegiate schools of nursing to support psychiatric training, bringing the number of such schools receiving support to 71. This undergraduate program was started three years ago. Seven hundred and thirty-seven medical student stipends totaling $32,776 have been awarded. This is an increase of 313 over those awarded last fiscal year. This program, initiated in the summer of 1957, permits medical schools to offer a $600 stipend to a medical student for extracurricular clinical or research training in psychiatry.

Increased Stipends for Fellowships.—An increase in stipend rates for research fellowships has been announced by the National Science Foundation and the U. S. Public Health Service. The increased stipends, now available for future fellowships, put into effect the recommendations of senior scientists in training centers throughout the nation, said Dr. Alan T. Waterman, director of the National Science Foundation, and Dr. Leroy E. Burney, surgeon general of the Public Health Service.

The stipends from both agencies at the predoctoral level will be increased by $200. This will raise the stipend to $1,800 for the first year, $2,000 for the intermediate year, and $2,200 for the terminal year. Predoctoral allowances have been increased to permit $500 for each dependent. The new stipends for both agencies at the postdoctoral level will be $4,500 for the first year and $5,000 for the second year. In addition, postdoctoral allowances have been increased to provide $500 for each dependent. Other allowances for certain travel expenses and research supplies will remain unchanged.

DEATHS

Alter, Samuel, Philadelphia; Jefferson Medical College of Philadelphia, 1925; an associate member of the American Medical Association; member of the American Academy of General Practice; veteran of World War II; died in the Veterans Administration Hospital Sept. 23, aged 59.

Anderson, John F., New Brunswick, N. J.; born in Fredericksburg, Va., March 14, 1871; University of Virginia School of Medicine, Charlottesville, 1896; an associate member of the American Medical Association, serving as a member of the House of Delegates in 1916 and chairman of the Section on Pharmacology and Therapeutics in 1913-1914; in 1914 elected a member of the Council on Pharmacy and Chemistry of the American Medical Association; a past-president of the American Association of Pathologists and Bacteriologists and the American Public Health Association; past-vice-president of the Society for Experimental Pathology; in 1938-1939 president of the American Drug Manufacturers Association; member of the Association of American Physicians; member of the U. S. Pharmacopoeia conventions, served twice as vice-president, and also as a member of the Revision Committee; assisted the committee with the last three revisions of the U. S. Pharmacopoeia; entered the U. S. Marine Hospital Service as assistant surgeon in March, 1898; served at Ellis Island in the inspection of immigrants; was detailed as sanitary observer in Oporto-Spain, Liverpool, England, and Glasgow, Scotland; then became sanitary attache to United States consulates in Barcelona, Spain, Marseilles, France, Vienna, Austria, London and Liverpool, England; in 1901, became affiliated with the Hygienic Laboratory, U. S. Public Health Service, becoming its director in 1909, and served until 1915; resigned to become director of the Research and Biological Laboratories of E. R. Squibb & Sons, becoming a member of the board of directors in 1917 and vice-president in 1919, holding these positions until his retirement in 1946; in 1956, made a gift to his alma mater to establish a lectureship to be known as the John F. Anderson Memorial Lectures in Medicine; author of many published papers on phases of public health; served as director of the Greater New Brunswick Chamber of Commerce and vice-president of the New Brunswick Savings Institution; died in St. Peter's General Hospital Sept. 29, aged 87, of heart disease.

Boone, Henry H. Ⓜ Chicago; Chicago Medical School, 1919; died Sept. 30, aged 74, of chronic myocarditis and arteriosclerosis.

Bunker, Charles Waite Orville Ⓜ Rear Admiral, U. S. Navy, retired, Bethesda, Md.; born in Viroqua, Iowa in 1882; Cornell University Medical College, New York City, 1905; appointed assistant surgeon in the medical corps of the Navy Sept. 21, 1907, attained the grade of Rear Admiral, June 23, 1942; served in 1914 with the Fleet Marine Force during the Mexican Campaign, and during World War I with the Atlantic Transport Service, and the U. S. Naval Aviation Forces in Italy; in 1919 became executive officer of the Naval Hospital at Brest, France; in 1920 served as an instructor at the Naval Medical School, Washington, D. C.; left for Turkey in 1923 to serve on the staff of the U. S. High Commissioner there; became head of the bureau of medicine and surgery's planning division in 1931; was commanding officer of the Naval Hospital, Brooklyn, of the Naval Medical School and the National Naval Medical Center, Bethesda, Md., where he served until retired in July, 1944; was awarded various medals; service member of the American Medical Association; fellow of the American College of Surgeons; died Sept. 17, aged 76, of arteriosclerotic heart disease, myxedema, and cirrhosis of the liver.

Carter, Lew Arthur, O'Neill, Neb.; Kansas City (Mo.) Hahnemann Medical College, 1903; past-president of the Holt County Medical Society; past-president of the board of education; served as an examining surgeon for the U. S. Bureau of Pensions; formerly city physician and member of the board of insanity of Holt County; served as chairman of the Holt County American Red Cross; on the staff of St. Anthony Hospital, where he died Sept. 4, aged 82, of dilatation of the heart.

Cattermole, George Stephenson Ⓜ Denver; University of Colorado School of Medicine, Denver, 1926; a member of the staff of St. Luke's Hospital; died Sept. 8, aged 58, of coronary artery disease.

Chobot, Robert Ⓜ New York City; Columbia University College of Physicians and Surgeons, New York City, 1924; associate clinical professor of pediatrics at the New York University Post-Graduate Medical School; specialist certified by the American Board of Internal Medicine; member of the American Academy of Allergy; fellow of the American College of Physicians; past-president of the Society for the Study of Asthma and Allied Conditions; on the staffs of the University and Roosevelt hospitals; died in London, England, Sept. 26, aged 57, of coronary thrombosis.

Ⓜ Indicates Member of the American Medical Association.

Coletta, John Joseph Ⓜ Columbus, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1934; on the staffs of the Mercy and Grant hospitals; died Sept. 22, aged 50, of acute coronary occlusion.

Collins, Joseph Kennard Ⓜ Falmouth, Mass.; Boston University School of Medicine, 1952; certified by the National Board of Medical Examiners; member of the American Academy of General Practice; served a residency at the Taunton (Mass.) State Hospital; died in the Peter Bent Brigham Hospital, Boston, Sept. 7, aged 37.

Combs, Victor Ray, Phoenix, Ariz.; Hospital College of Medicine, Louisville, 1905; veteran of World War I; died in the Veterans Administration Hospital Aug. 29, aged 80.

Cornell, Beaumont Sandfield Ⓜ Huntington, Ind.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1916; L.R.C.P., of London, and M.R.C.S., of England, 1930; specialist certified by the American Board of Internal Medicine; formerly practiced in Fort Wayne, Ind., where he was on the staff of the Fort Wayne State School and member of staff of the Lutheran Hospital; editor emeritus of *The American Journal of Digestive Diseases;* died in the Huntington County Hospital Sept. 16, aged 66, of coronary occlusion.

Denman, Morris Aquila Ⓜ Livingston Manor, N. Y.; Northwestern University Medical School, Chicago, 1932; certified by the National Board of Medical Examiners; served as president-elect of the Sullivan County Medical Society; associated with Liberty-Loomis and Liberty Maimonides hospitals in Liberty; formerly Rockland town health officer; school physician; died Sept. 5, aged 54, of coronary thrombosis.

Dungay, Neil Stanley, Northfield, Minn.; University of Minnesota Medical School, Minneapolis, 1925; an associate member of the American Medical Association; fellow of the American Public Health Association; for many years associated with the faculty of Carleton College; served on the staff of the Northfield City Hospital, where he died Sept. 19, aged 75, of cerebral hemorrhage.

Eilers, Paul Gerhard, La Mesa, Calif.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1900; veteran of World War I; formerly associated with the Indian Service; died in the U. S. Naval Hospital, San Diego, Sept. 13, aged 80, of cancer.

Estabrook, Bert U. Ⓜ Detroit; Detroit College of Medicine, 1903; deputy health commissioner for 25 years, retiring in 1947; at one time on the faculty of his alma mater; died in the Harper Hospital Sept. 15, aged 78.

Exter, Donald John Ⓜ Pasadena, Calif.; University of Southern California School of Medicine, Los Angeles, 1943; fellow of the American College of Surgeons; specialist certified by the American Board of Surgery; on the staffs of the Alta Vista and Collis P. and Howard Huntington Memorial hospitals; died Sept. 20, aged 39, of a self-inflicted bullet wound.

Fellers, Ray Leopold Ⓜ Detroit; Detroit College of Medicine and Surgery, 1915; member of the American Academy of General Practice and the Association of Military Surgeons of the United States; on the staffs of the Mount Carmel Mercy Hospital and Providence Hospital, where he died Sept. 12, aged 71, of pulmonary thrombosis.

Flynn, Edward Anthony Ⓜ Belleville, N. J.; University of Vermont College of Medicine, Burlington, 1915; veteran of World War I; associated with St. Vincent's Hospital, where he was past-president of the medical staff and St. James Hospital in Montclair; affiliated with Presbyterian Hospital in Newark and St. Mary's Hospital in Passaic; chief of gastroenterology on the staff of St. Michael's Hospital in Newark, where he died Sept. 28, aged 65, of injuries received in an automobile accident Sept. 19.

Gancher, Jacob Isaac Ⓜ Waterbury, Conn.; Long Island College Hospital, Brooklyn, 1906; member of the American Academy of General Practice; a member of the original staff of St. Mary's Hospital; died in the Waterbury Hospital Sept. 16, aged 74.

Haines, Willits Parker, Ocean City, N. J.; Jefferson Medical College of Philadelphia, 1897; past-president of the Medical Society of Cape May County; served as acting assistant surgeon in the U. S. Public Health Service; a member of the honorary staff at Shore Memorial Hospital, Somers Point; died Sept. 11, aged 85.

Hall, James Frank Ⓜ Colonel, U. S. Army, retired, Washington, D. C.; Harvard Medical School, Boston, 1899; service member of the American Medical Association; fellow of the American College of Surgeons; entered the regular Army in 1901 and retired Sept. 30, 1933; died in the Walter Reed Army Hospital Sept. 2, aged 84.

Harper, Stephen F., Ashland City, Tenn.; University of Nashville Medical Department, 1910; died in the Baptist Hospital, Nashville, Sept. 19, aged 73, of myocardial infarction.

Holland, Robert E. Lee, Dallas, Texas; University of Vermont College of Medicine, Burlington, 1895; at one time associated with the Deaf, Dumb and Blind Institute for Colored Youths of Texas; died Sept. 9, aged 93.

Hood, Arthur James Ⓜ Elko, Nevada; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; past-president of the Elko County Medical Society; on the staff of the Elko General Hospital; died Sept. 19, aged 78, of chronic renal failure.

Jackson, Albert F., Nutley, N. J.; Columbia University College of Physicians and Surgeons, New York City, 1905; for many years school physician; director and vice-president of the Bank of Nutley; on the staffs of the Mountainside Hospital in Montclair, Presbyterian Hospital in Newark, and the Passaic (N. J.) General Hospital, where he died Sept. 11, aged 79, of coronary thrombosis.

Jewel, Robert Theodore Ⓜ Los Angeles; State University of Iowa College of Medicine, Iowa City, 1892; died in the Good Samaritan Hospital Sept. 13, aged 93, of acute coronary thrombosis.

Jones, Lemuel Winfield, Waco, Texas; (licensed in Texas under the Act of 1907); served on the staffs of the Hillcrest Memorial and Providence hospitals; died Sept. 1, aged 92.

Kleiner, Blanche F. Ⓜ Philadelphia; Imperial University of St. Petersburg, Russia, 1919; died in the Lankenau Hospital Sept. 18, aged 69.

Kusnitz, Morris Jr. Ⓜ Alamo, Ga.; Emory University School of Medicine, Atlanta, 1936; died in the Macon (Ga.) Hospital Sept. 7, aged 51, of cerebral hemorrhage.

Loeb, Herbert Ⓜ North Attleboro, Mass.; Julius-Maximilians-Universität Medizinische Fakultät, Wurzburg, Bavaria, Germany, 1931; on the staff of the Sturdy Memorial Hospital in Attleboro; died Aug. 12, aged 56, of coronary thrombosis.

McMahon, Ralph James Ⓜ Binghamton, N. Y.; University of Buffalo School of Medicine, 1921; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; president of the Broome County Medical Society; past-president of the Binghamton Academy of Medicine; on the staffs of the Ideal Hospital in Endicott and Binghamton and Our Lady of Lourdes Memorial hospitals; died Sept. 10, aged 60, of coronary thrombosis.

Meddis, Victor Newcomb Ⓜ Colonel, U. S. Army, retired, San Antonio, Texas; Hospital College of Medicine, Louisville, 1902; service member of the American Medical Association; fellow of the American College of Surgeons; entered the medical corps of the U. S. Army in 1920; retired July 31, 1943; died in the Brooke Army Hospital Aug. 31, aged 79, of cancer of the pancreas.

Munson, Alban Elliott, Nyack, N. Y.; University and Bellevue Hospital Medical College, New York City, 1899; an associate member of the American Medical Association; surgeon, New York Central Railroad; for many years on the staff of the Union Hospital in New York City, where he was trustee; died in the Cottage Hospital, Santa Barbara, Calif., Sept. 22, aged 84, of cerebral hemorrhage.

Nixon, Edwin Allen Ⓜ Seattle; State University of Iowa College of Medicine, Iowa City, 1928; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; past-president of the Seattle Surgical Society; on the staffs of the Columbus, Doctors, Swedish, and Providence hospitals; died Sept. 6, aged 61.

O'Connor, Clarence Joseph, New York City; Fordham University School of Medicine, New York City, 1921; also a lawyer; member of the Medical Society of the State of New York; past-president of the Bronx County Medical Society; served for many years as an honorary police surgeon; a founder and past-president of the Catholic Physicians Guild; a member of the American Board of Legal Medicine; president of the medical board and chief of medicine of Union Hospital; died Sept. 17, aged 61, of cerebral hemorrhage.

Olkon, David Mortimer Ⓜ Los Angeles; born in Wilna, Russia, Sept. 15, 1877; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; associate professor of psychiatry emeritus at his alma mater; specialist certified by the American Board of Psychiatry and Neurology; member of the American Academy of Neurology, Scientific Reserve Society of America, and Sigma Xi; fellow of the American Psychiatric Association; veteran of World War I; attending psychiatrist at the Cedars of Lebanon Hospital; at one time practiced in Chicago; served as director of the Los Angeles Neurological Institute; died Jan. 29, aged 80, of cancer of the prostate.

Owens, Frank Joseph, St. Paul; University of Minnesota Medical School, Minneapolis, 1955; served an internship at the Ancker Hospital in St. Paul and a residency at the University of Minnesota Hospital and Veterans Administration Hospital in Minneapolis; died Sept. 4, aged 28.

Percy, Nelson Mortimer Ⓜ Chicago; born in Dexter, Iowa, Nov. 7, 1875; Rush Medical College, Chicago, 1899; professor of clinical surgery at the University of Illinois College of Medicine from 1920 to 1940, when he was named professor emeritus; member of the founders group of the American Board of Surgery, and of the American Surgical Association and the International Society of Surgeons; fellow of the American College of Surgeons; past-president of the American Goiter Association which in 1953 gave him its meritorious award; past-president of the Chicago Surgical Society; in 1917 organized U. S. Base Hospital 11 in France and served as its surgical director; a life member of the Chicago Historical Society, Art Institute, and the Natural Historical Society; joint author with Dr. Albert J. Ochsner of "Clinical Surgery" published in four editions, the first in 1912; developed the Percy method of whole blood transfusion; in 1951 the Nelson M. Percy Research Foundation was organized at the Augustana Hospital, where he became chief surgeon in 1925, chief of staff in 1935, serving until 1957, when he became emeritus chief of staff, and where he died Oct. 10, aged 82, of congestive heart disease.

Phillipsen, John Albert Ⓜ Wellington, Kan.; Northwestern Medical College, St. Joseph, Mo., 1894; for many years county coroner; on the staffs of the Hatcher and St. Luke's hospitals; died June 28, aged 86, of cancer.

Phillips, John William, Oilton, Okla.; Gate City Medical College, Texarkana, Ark., 1906; for 10 years mayor; for many years on the staff of the Cushing Municipal (Okla.) Hospital, where he died Sept. 11, aged 89, of intestinal obstruction.

Quaife, Lawrence Albert, Rosalia, Wash.; State University of Iowa College of Medicine, Iowa City, 1906; served as medical director for the Chicago and Milwaukee Railroad; died in Spokane, Sept. 6, aged 79, of cerebral hemorrhage.

Rittenhouse, Jacob S., Lorane, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1885; associated with the Community General Hospital in Reading; died Sept. 4, aged 97, of arteriosclerosis.

Ross, Rex Roy Ⓜ San Antonio, Texas; born in Newton, Mass., in 1888; Medical Department of Tulane University of Louisiana, New Orleans, 1912; veteran of World War I; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; past-president of the Bexar County Medical Society; associated with the Woodmen of the World Memorial Hospital; consulting chief urologist at the Robert B. Green Memorial Hospital; on the staffs of the Santa Rosa Hospital and the Nix Memorial Hospital, where he died Aug. 12, aged 70, of cerebral hemorrhage and arteriosclerosis.

Reeves, Alfred Edwin, North Platte, Neb.; Ensworth Medical College, St. Joseph, Mo., 1904; an associate member of the American Medical Association; veteran of World War I; on the staffs of Memorial Hospital and St. Mary Hospital, where he died Sept. 1, aged 77, of pneumonia, and chronic myocarditis.

Rinker, George Earnest Ⓜ Oto, Iowa; Sioux City (Iowa) College of Medicine, 1903; served as mayor, member of the town council, and president of the board of education; died in Sioux City Sept. 16, aged 81.

Rodenheiser, Edwin William, Upper Darby, Pa.; Washington University School of Medicine, St. Louis, 1913; specialist certified by the American Board of Pediatrics; an associate member of the American Medical Association; member of the American Academy of Pediatrics; fellow of the American College of Physicians; for many years on the staff of the Delaware County Hospital in Drexel Hill; consultant pediatrician at the Misericordia Hospital in Philadelphia, Thomas M. Fitzgerald Mercy Hospital in Darby, and Chester (Pa.) Hospital; on the courtesy staff, the Bryn Mawr (Pa.) Hospital, where he died Sept. 24, aged 67, of hypertensive cardiovascular disease.

Scott, William Wylie Ⓜ Orlando, Fla.; Medical Department of Grant University, Chattanooga, Tenn., 1907; University of Worster Medical Department, Cleveland, 1909; formerly practiced in Canton, Ohio; member of the Ohio State Medical Association; past-president of the Canton Academy of Medicine and past-treasurer of the Stark County (Ohio) Medical Society; died Sept. 7, aged 77, of cerebral vascular accidents.

Seligman, Hans Ⓜ Groton, N. Y.; Universität Bern Medizinische Fakultät, Switzerland, 1937; formerly school physician; on the staff of the Cortland (N. Y.) Memorial Hospital; died Sept. 11, aged 46, of rheumatoid arthritis and duodenal ulcer.

Shemeley, William G. Jr., Darby, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1910; veteran of World War I; an associate member of the American Medical Association; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; died in the Hahnemann Hospital, Philadelphia, Sept. 18, aged 70, of myocardial infarction.

Simmons, Harold Leonard Jr. Ⓜ New Bedford, Mass.; Boston University School of Medicine, 1944; certified by the National Board of Medical Examiners; interned at the Boston City Hospital; served a residency at the Cambridge City Hospital in Cambridge; served in the medical reserve corps of the U. S. Army; died in the Massachusetts General Hospital, Boston, Sept. 1, aged 43.

Slack, Louise Wetherill, Silver Spring, Md.; Woman's Medical College of Pennsylvania, Philadelphia, 1937; served in the medical corps of the U. S. Naval Reserve during World War II; on the staffs of the Lancaster General and St. Joseph's hospitals in Lancaster, Pa.; since 1954 employed by the department of health in Washington, D. C.; died Sept. 8, aged 50, of an overdose of barbiturates, self-administered.

Slate, John William Ⓜ High Point, N. C.; University College of Medicine, Richmond, 1900; member of the board of county commissioners for Stokes

County from 1918 to 1922; on the staff of the High Point Memorial Hospital; died Sept. 12, aged 81, of coronary disease.

Steves, Bert Jerome Ⓜ **Menomonie,** Wis.; Chicago Homeopathic Medical College, 1903; Northwestern University Medical School, Chicago, 1908; died in Fort Dodge, Iowa, Sept. 8, aged 84.

Sutton, Lyle Adin Ⓜ Albany, N. Y.; Albany Medical College, 1921; associate clinical professor of gynecology and obstetrics at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; veteran of World War I; chief of gynecology, Child's Hospital; on the attending staff at Memorial Hospital; consulting gynecologist at Memorial Hospital of Greene County, Catskill, and Moses–Ludington Hospital, Ticonderoga, and on the staff of the Albany Hospital, where he died Sept. 13, aged 62, of cardiac failure.

Takos, Michael James, Miami, Fla.; University of Michigan Medical School, Ann Arbor, 1951; director of research and special studies and epidemiologist for Dade County Health Department; for four years was assigned to the army's malarial control group, teaching at the school of malariology in the Panama Canal Zone; interned at the Gorgas Hospital in Ancon, C. Z., where he served a residency; received the degree of master of public health from Harvard School of Public Health in Boston; died Sept. 9, aged 39, of acute coronary occlusion.

Tetrault, Philias Eugene, Putnam, Conn.; Middlesex College of Medicine and Surgery, Cambridge, Mass., 1920; veteran of World War I; a member of the advisory board of Annhurst College in South Woodstock; died Sept. 16, aged 66.

Thomason, Charles Franklin, Whites Creek, Tenn.; Vanderbilt University School of Medicine, Nashville, 1914; veteran of World War I; died Sept. 7, aged 73, of arteriosclerosis.

Warren, Robert Franklin, Prospect Hill, N. C.; Atlanta School of Medicine, 1911; member of the Medical Society of the State of North Carolina; died in the North Carolina Memorial Hospital, Chapel Hill, Sept. 11, aged 74, of carcinoma of the lung.

Whedon, Edwin Earl Ⓜ Sheridan, Wyo.; born in Hudson, Ohio, April 29, 1872; Gross Medical College, Denver, 1902; past-president of the Wyoming State Medical Society of which he was secretary for 18 years; member of the House of Delegates of the American Medical Association in 1922 and 1930; for 15 years chairman of the Wyoming division of the American Cancer Society; past-president and for many years a member of the board of health; in 1910 city treasurer; for many years on the Rocky Mountain Medical Conference Committee; in 1954 established the Earl and Bessie Whedon Cancer Detection Fountain Center; served as Wyoming editor of the *Rocky Mountain Medical Journal*; associated with Sheridan Memorial Hospital, where he died Sept. 10, aged 86.

White, John Edward, Kerrville, Texas; Cleveland Medical College, Homeopathic, 1891; for many years associated with the Veterans Administration; formerly medical director of the Nordrach Ranch Sanitarium in Colorado Springs; veteran of World War I; died in the Sid Peterson Memorial Hospital Sept. 9, aged 87.

Williams, Charles Leroy, McMinnville, Ore.; University of Louisville (Ky.) Medical Department, 1903; at one time mayor; served on the staff of the McMinnville Hospital, where he died Sept. 8, aged 84, of pneumonia.

Williams, Hiram, Paterson, N. J.; New York University Medical College, New York City, 1896; for many years practiced in Passaic, where he was a member of the board of education; for more than 40 years examining physician for Prudential Life Insurance Company; for many years chief surgeon at Passaic General Hospital; at one time city health officer; an associate member of the American Medical Association; died in the Christian Sanatorium Wyckoff, Sept. 4, aged 89, of cerebral thrombosis

Williams, Stuart Dudley Ⓜ Richmond, Va.; Medical College of Virginia, Richmond, 1917; service member of the American Medical Association; veteran of World War I; associated with the Veterans Administration Hospital; died Sept. 13, aged 65, of acute coronary insufficiency.

Willson, William Herbert Ⓜ Greenfield, Ohio Medical College of Ohio, Cincinnati, 1897; veteran of the Spanish–American War; served as a member of the county board of health; associated with the Greenfield Municipal Hospital, where he died Sept. 7, aged 84, of cerebral hemorrhage and injuries received in an automobile accident.

Winchell, George D., Rose, N. Y.; University of Buffalo School of Medicine, 1893; an associate member of the American Medical Association; for many years county coroner; died Sept. 22, aged 96, of coronary thrombosis.

CORRECTION

Dr. Arthur Kirby Baldwin Is Not Dead.—THE JOURNAL for Nov. 1, page 1250, erroneously reported the death of Dr. Arthur Kirby Baldwin. Dr. Baldwin is still living at Carrollton, Ill., and he was named by the Illinois State Medical Society in May as "General Practitioner for 1958." The source of our information was the *News Letter* of the American Society of Anesthesiologists for September.

FOREIGN LETTERS

BRAZIL

Sinusitis.—Drs. Raphael da Nova and Décio Mion (*Revista do Hospital das Clinicas*, vol. 13, July-August, 1958) analyzed 1,593 cases of chronic sinusitis and concluded that conservative therapy gave the best immediate results. Conservative treatment was applied in 53 cases of chronic maxillary sinusitis classified as purulent, allergic, and puruloallergic. The purulent group was treated locally with streptokinase and streptodornase combined with tetracycline by mouth. The second category was treated with hormones and antibiotics. Chronic sinusitis is predominantly maxillary, and an allergic factor is important in its cause. Surgical treatment has become less popular since the appearance of antibiotics.

Prevention of Leprosy.—Fernandez and Nelson Souza Campos have stated that leprosy can be prevented by the use of BCG vaccine. In order to investigate this point of view, Dr. A. C. Pereira at the Medical School of Juiz de Fora, Minas Gerais, studied the children of leprous parents and children withdrawn from a focus of leprosy (these children having been admitted to a preventorium). From the time his study began, in 1943, he made tuberculin and lepromin tests on all the children. From 1950 on he began to give BCG vaccine by mouth for periods of one, three, and six months to obtain a complete reversal of the lepromin test from negative to positive. In an eight-year follow-up such tests remained positive. As about 33% of those with negative tests had been permanenty discharged, it was concluded that vaccination by BCG is an effective preventive of leprosy.

CANADA

Gastroenteritis.—A group of workers from Montreal and another from Kingston, Ont., emphasized the important role of coliform organisms in epidemic diarrhea in infants. The Montreal group (*Canad. M. A. J.* 79:351, 1958) isolated a new serotype (already incriminated in outbreaks in the United States), known as O127:B 8, and identified it as the cause of an epidemic in a children's hospital. Of 796 infants who were in hospital with diarrhea during a 10-month period, 258 were harboring this strain. Of these, 187 were infected in the hospital while under treatment for other conditions. Premature and newborn infants were very susceptible. Strains were at first sensitive to neomycin, but later showed emergence of resistance. Nitrofurantoin proved to be the therapeutic agent of choice. There were 28 deaths. Autopsy findings were nonspecific (intestinal congestion and hemorrhage). The serotype described is widespread in the province of Quebec. The Kingston group recorded a series of hospital infections over a five-year period and found a wide range of serological types of Escherichia coli. They encountered one epidemic with the O11:B4 type, but the proportion of E. coli infections among infants admitted with diarrhea was somewhat less than in the Montreal series. They found that giving polymyxin B by mouth was effective in shortening the duration and diminishing the severity of the infection and favored giving prophylactic doses to staff and patients in the presence of an epidemic. They urged, as did the Montreal workers, that in any epidemic of infantile diarrhea investigation for types of E. coli be carried out, with reduction in infectivity of all positive cases by neomycin or polymyxin B. Visiting must be restricted and a routine survey of all contacts for coliform organisms must be carried out. Moreover, when epidemics are present in the district, the screening of all admissions for carriers should be carried out.

Antibiotic Disks.—The Biologics Control Laboratories of the Canadian government complained last year of the poor quality of antibiotic disks coming into Canada and tightened up their control of these diagnostic products. They invited manufacturers (practically all from the United States) to cooperate by sending in samples and protocols of assay of disks. In a recent paper (*Canad. M. A. J.* 79:383, 1958) they reviewed the results of this voluntary control system, in which four manufacturers (not representing all who could have cooperated) sent in samples for checking over a year. The results showed a great improvement during this period. The problem has apparently been that manufacturers relied solely on performance tests for controlling their products, whereas the Canadian testers have developed an assay method using an extraction technique for obtaining the antibiotic from the disk. In one cooperating company, the rejection rate for low potency dropped from 15% to zero within a few months, and for another firm the rate dropped from 75 to 15%. Nevertheless, the program is being continued, and the government is considering more

---

The items in these letters are contributed by regular correspondents in the various foreign countries.

effective regulations for the import of disks, noting that the authorities in the United States are also considering this problem.

Tetanus Toxoid.—The Academy of Medicine, London, Ontario, has had a committee studying the question of extensive tetanus immunization among the population for some time and has published a report on its findings (*Canad. M. A. J.* 79:410, 1958). It urges every physician to use his opportunities to increase the number of persons in the community immunized with tetanus toxoid and emphasizes once more that a full course of toxoid immunization must include four primary immunizing doses of which the recall dose 6 to 12 months after the first series is one. Booster doses every five years are recommended. Antitoxin must also be used when indicated. Local groups are encouraged to participate in a research plan to obtain accurate information about the incidence of allergic reactions to tetanus antitoxin in previousy immunized persons and others. Attempts will be made to promote mass immunization by the press, television, and other media and by encouraging immunization of students. The emergency departments of hospitals should give toxoid to patients if possible (but not in the same syringe as antitoxin). The provincial departments of health are requested to assume responsibility for an adequate recording system, which is at present lacking.

Insurance Plan and Public Health.—Two medical administrators in the federal government discussed the new hospital insurance and diagnostic services setup at the annual meeting of the Canadian Public Health Association (*Canad. J. Pub. Health* 49:317, 1958). Cameron discussed the general administrative systems being developed to operate provincial health insurance programs. There were some differences among the provinces, some establishing their program within the provincial health department, while others had organized a special commission with a single commissioner or board of commissioners reporting to the provincial legislature through the Minister of Health or some other responsible minister. Almost all provincial health insurance plans had developed some form of rate board to review and approve hospital budgets and establish rates for services provided. Provinces will report their expenditures under the program each month to the federal government, which will make monthly payments to the province as an advance on money due at the end of that year. A good program of research and statistics is being developed, and it is hoped that soon each province will have a punch card system for every hospital admission showing accounting data, diagnostic information, use of hospital services, and possibly basic social data on the patient.

Charron referred to the integration and coordination of preventive and curative medical activities within the hospital insurance and diagnostic services program. The fact that the Minister of National Health and Welfare is responsible for hospital insurance will make such integration easier. One area where problems will arise is that of national health grants to provinces. A joint administrative section had been set up to serve both health insurance and health grants and thus avoid duplication. The consultant services at Ottawa in various fields of public health, such as nutrition or child and maternal health, will be available for consultation in health insurance matters. As an illustration of the need for coordinated and continued health care, Charron cited the care of children. The hospital would have to work in conjunction with community public health services to assure continuity of treatment. In such areas, he believed that the development of services under the insurance plan would help to close the traditional gap existing between preventive and therapeutic medicine. Development of outpatient diagnostic services would also require consultation between public health workers and hospital laboratory workers to avoid duplication and maintain high standards. Similarly, rehabilitation and home care services would require constant cooperation.

Brachial and Digital Blood Pressure.—At the University of Manitoba, Gaskell and Krisman (*Canad. J. Biochem.* 36:883, 1958) developed an auscultatory technique for measuring the digital blood pressure. They use a stethoscope in which the diaphragm has been replaced by a digital plethysmograph, into which a finger is sealed. The technique is similar to the usual one for measuring brachial blood pressure, sounds being heard through the stethoscope as a pneumatic cuff around the finger base is deflated. The first sound heard appears to be as reliable an index of systolic pressure as any other. By using this technique in combination with the usual one, the authors were able to study the brachial to digital systolic and diastolic pressure gradients in normal subjects and hypertensive patients under various conditions. This gradient is small when the subject is cool but much increased when he is heated. The gradient in essential hypertension was similar to the normal gradient for diastolic pressures but greater for systolic pressures.

Maternal Mortality.—A recent report (*Ontario Department of Health*, Special Report no. 5) presented some data on trends in maternal mortality in Ontario between 1921 and 1955. The trend in maternal mortality followed that displayed in other countries and other areas. In 1921 the maternal mortality rate in Ontario was 5.22 per 1,000 live births. By 1931 it was still unchanged, but in 1938 it began to diminish sharply. By 1941 it had fallen to 3.03 and continued to fall until it had reached 0.54. The current hazard of childbirth in Ontario is therefore only one-tenth of what it was before 1938. Infant mortality showed a similar though not so sharp decline. These curves were accompanied by a fall in the actual live birth rate up to the time of World War II with a sharp rise afterwards to a figure just above that for 1921. An interesting feature of these statistics was the calculation by the statisticians of "lost years of reproductive life" by taking an arbitrary upper limit of 50 years and calculating how many years were lost to the population by maternal deaths before this age. These calculations show that between 1935 and 1955 the annual number of reproductive years lost was cut by 80%. In other terms, a total of 4,900 years was saved for reproduction by the dramatic and sustained fall in mortality. In line with findings elsewhere, the chief cause of fall in maternal mortality was the fall in incidence of infection. Infection has been replaced by toxemia as the first ranking cause of maternal death, though the rate for toxemia has also fallen.

Patients and Parking.—Parking in the downtown area of Saskatoon is just as difficult as in most American cities. Patients visiting their doctors often receive parking tickets, but in future the police will be more lenient with them. The Board of Police Commissioners has approved the recommendation that notes signed by physicians and dentists for their patients who receive parking tickets will be acceptable at the police station in cancellation of the ticket. Forms will have to be signed by the physician or dentist in person. Nurses and receptionists will have no authority to sign the notes. If the courtesy is abused it will cease.

Alcoholism.—The Ontario Alcoholism Research Foundation reviewed once more the figures for alcohol use and alcoholism in Ontario. The foundation now estimates that, in the decade from 1946 to 1955, the number of alcoholics increased from 31,820 to 63,070, a jump of 98.2%. Even allowing for population growth in the age groups affected, this represents an increase in the adult rate of 65.2%. In terms of the estimated number of actual users of alcoholic beverages, it represents an increase of 55.2%. During the survey period, the percentage of the Ontario population using alcohol increased from 65 to 71% and the average per capita consumption from 1.28 to 1.69 gallons. In this period, consumption of wine slightly decreased while consumption of beer and of spirits increased. The rate of alcoholism for Ontario was slightly above average for Canada, lower than that for British Columbia, slightly lower than that of Quebec, and much lower than that of the United States.

GERMANY

Operating Time. — R. Nissen (*Deutsche med. Wchnschr.* 83:1765, 1958) related the historical development of surgical technique and the duration of operation at various periods. Thus, in the preanesthetic era, time-saving operative technique was a necessity. Since the introduction of anesthesia and asepsis, however, the discussion of the speed of operating has not ceased. Kocher, Halsted, and Cushing deliberately sacrificed speed to the needs of careful tissue handling and hemostasis. Perhaps a mistake was made in generalizing their teachings, which in certain situations and for certain operations, such as those on the brain, were valid. Even today there are far-reaching differences in operative techniques between North America and European surgeons. To relate the progress in American surgery to a further development of Halsted's principles is an exaggeration. Similarly the emphasis on speed at all cost may result in dangerous neglect of careful handling. A number of tried and reliable rules make it possible to hold the length of operation to a minimum. It is pointed out that advances in modern surgery make it necessary for young surgeons to be trained in both speed and dexterity. In many operations unnecessary delay adds appreciably to the risks, e. g., operations in the elderly, combined abdominothoracic operations, and intracardiac procedures. The speed of operating should be adjusted to the general condition of the patient and the size of the operative field.

Endoscopy of the Biliary Tract.—H. Wildegans (*Deutsche med. Wchnschr.* 83:1775, 1958) said that in performing endoscopy of the biliary tract he uses a catheter (18 to 25 F.) modified by the inclusion of a lens system with an ocular, a source of light, and provision for flushing. Indications and contraindications for biliary endoscopy are the same as for common bile duct exploration. It is contraindicated in the presence of fresh signs of a preceding acute pancreatic necrosis. Visible gallstones are removed first. The endoscope is then introduced first towards the duodenum, then towards the liver under constant flushing with warm isotonic sodium chloride solution. In end-on vision the common bile duct appears as a cylindrical tube which, funnel-like, narrows towards the ampulla of Vater. The mucosa has an orange cast and contains small, red vessels arranged in a network. The ampulla has a variable appearance. Once the tip of the endoscope has gone past it, the duodenum becomes visible.

Small, movable gallstones often cause inflammatory changes in the surrounding mucosa. The removal of concretions, especially of obstructing stones in the ampulla or clumps of stones, can be accomplished under direct vision through the endoscope. Endoscopy is useful in the differential diagnosis of diseases of the biliary tract. The ostia of the right and left hepatic ducts are oval. If these ducts are dilated, it is often possible to look far into both lobes. Stones in a hepatic duct are clearly visible through the endoscope. This method provided a means of determining whether all concretions have been removed. Furthermore, the degree and extent of cholangitis are easily diagnosed. The author performed endoscopy during laparotomy in 151 patients with suspected disease of the biliary tract. Gallstones were seen in 94 (of which 26 had stones in the hepatic duct). Cholangitis was found in 73 patients and dilatation of the biliary tract without mechanical obstruction was seen in 45. Stenosis of the ampulla was noted in only four patients. Endoscopy does not exclude cholangiography. These procedures are complementary. If good preoperative cholecystograms are available, endoscopy is preferred to cholangiography at the time of operation.

INDIA

New Amebicide.—Sachdev and Dhupar (*J. Indian M. A.* 31:5 [Sept. 1] 1958) treated 27 patients who had amebiasis with a new drug (11,925). Patients with active diarrhea whose stools contained Endameba histolytica in the form of trophozoites or cysts were selected for the trial. Most of them were also subjected to a sigmoidoscopic examination. The material swabbed during sigmoidoscopy was examined. The patients were given two 100-mg. tablets three times a day for 10 days. Stool examination and sigmoidoscopy were done repeatedly after completion treatment for a period of six months. Symptomatic relief was obtained in all cases. The frequency of stools was reduced within 48 to 72 hours, and the stools were well formed by about the seventh day. From the 10th day on, the parasite could not be demonstrated in stools by microscopic examination, and sigmoidoscopy revealed either healed or healing ulcers. Of the 27 patients, 22 remained asymptomatic on subsequent examinations. The drug was well tolerated by all but one of the patients.

Intestinal Helminthic Infection.—Bhaduri and Arora (*Bull. Calcutta School Trop. Med.* 6:1 [Jan.] 1958) studied the incidence of intestinal helminthic infection in a mixed population of an industrial area. Stools of 290 unselected men from a total of 5,000 workers were examined. Evidence of helminthic infection was obtained in 114, or 39.3% Hookworms infection was obtained in 114, or 39.3%. Hookworms worms in 20; the rest had pinworms, Strongyloides, Hymenolopis nana, and Heterodera. Thus the hookworm rate was 23.1%, and the roundworm rate was 5.5%.

Postmalarial Splenomegaly.—R. N. Chaudhari (*Bull. Calcutta School Trop. Med.* 6:1 [Jan.] 1958) reported a series of 154 patients with postmalarial splenomegaly. These formed part of a group of 203 patients who were investigated to find the cause of their tropical splenomegaly. Besides postmalarial splenomegaly, they included 22 with cirrhosis of the liver, 11 with posthepatic splenomegaly, 7 with thalassemia, 6 with extrahepatic portal obstruction, and 3 with metabolic disorders. Almost all those with postmalarial splenomegaly came from rural areas, most being young adults; 128 were male and the rest female. They belonged to the poorer classes, being chiefly farmers or laborers. The onset was insidious, and the duration of enlargement varied from 2 to 21 years. All gave a history of fever suggestive of malaria, in the beginning. The persons with advanced cases were malnourished and cachectic; 114 had fever while in the hospital. The splenic enlargement varied between 3.5 and 10 in. below the costal margin. It was aggravated during febrile attacks and receded a little after the attack. The spleen was firm, smooth, painless, and mobile. The liver was enlarged to a variable extent in most patients, the left lobe usually being larger than the right. It was soft and smooth except in advanced cases when it was hard and irregular. Five with advanced splenomegaly had jaundice, and 7 gave a history of hematemesis or melena; 18 had ascites, 3 of whom had tuberculosis. The patients with advanced cases showed an altered albumin-globulin ratio with increased thymol turbidity.

Examination of the spleen, removed at operation or postmortem, showed that the normal appearance was lost. There was proliferation of the reticuloendothelial cells and giant cells and evidence of fibrosis. There was no evidence of malarial pigment. The liver showed a normal appearance in early cases and variable pathological changes in others which included focal necrosis, diffuse parenchymal degeneration, and fatty changes, while definite fibrotic changes were seen in terminal cases. Anemia of the orthochromic and slightly macrocytic type was seen in those with disease of long duration. Leukopenia was commonly present and thrombocytopenia in a few with advanced splenomegaly. Only two showed malarial parasites in the blood. Splenoportal venography showed dilated and tortuous splenic and portal veins, while collateral vessels were seen in very advanced cases. A barium meal showed esophageal varices in eight cases of long duration. The diagnosis was based on the history of residence in a rural area where malaria was hyperendemic, repeated attacks of malaria which were untreated or irregularly treated, progressive enlargement of the spleen more marked during the attacks and receding slightly after them, absence of jaundice or gastrointestinal bleeding except in terminal cases, leukopenia, a variable degree of anemia, little or no pathological change in the liver, no radiological evidence of portal obstruction in early cases, and negative tests for leishmaniasis.

Suppressive antimalarial therapy was found to be effective in early cases. Splenectomy was indicated in those with marked hypersplenism who did not respond to hematinics. The liver was not damaged, as revealed by a liver biopsy. Spontaneous and recurrent attacks of malaria occurred in about 50% of the patients who survived after splenectomy. Sixty were followed up for two to four years. Of these, 43 were treated medically and 17 were subjected to splenectomy. From the group not operated on, 22 with early cases were cured after suppressive antimalarial therapy for 6 to 12 months. Seven of the 14 with late cases showed a remarkable reduction in the size of the spleen, and others remained the same or became worse. Three of the seven in the terminal stage died, and the rest had recurrent attacks of hematemesis. Of the 17 who were operated on, 3 died of the operation and 2 died later. Five could not be traced, and the rest complained of progressive weakness and had irregular fever, and liver biopsy showed a much more advanced involvement of this organ as compared to the preoperative findings. Thus, malaria was the primary infection in these patients who developed reticuloendothelial hypertrophy and hypersplenism. To ascertain further the role of malaria in the causation of splenomegaly, a study was made to determine the effect of the control of malaria on the spleen rate in areas where malaria is known to be hyperendemic. The authors had examined 71 patients six years earlier. All but two showed improvement in general health; 24 had ceased to have a palpable spleen, and in 42 of the remaining 47 the enlargement was much less. The liver was also smaller than before. Thus antimalarial measures were definitely effective in reducing the size of the spleen by controlling the recurrent febrile attacks. With the control of malaria, the incidence of this condition was found to be greatly decreased.

Pulmonary Function Tests.—H. D. Singh (*J. Indian M. A.* 31:5 [Sept] 1958) determined the normal values for vital capacity, timed vital capacity (TVC), maximum breathing capacity, and maximum expiratory pressure in 25 healthy men between the ages of 40 and 62 years. These values were lower than those reported for men between the ages of 30 and 39. The vital capacity and one-second and two-second TVC values obtained here were again lower, and the maximum breathing capacity values were higher than the similar values obtained for an identical age group by western authors. This discrepancy between Indian and western subjects was observed in young adults as well. Since the maximum breathing capacity is a more reliable index of the ventilatory capacity of lungs, the study showed that pulmonary function in Indians is not inferior to that of western subjects.

Research Grants.—The Rockefeller Foundation gave seven grants to various institutions in India—more than to any other country. These grants include $58,000 to the Indian Council of Medical Research for postgraduate training fellowships for teachers in Indian medical colleges to be spread over the next three years. A grant of $45,000 was made to the Institute of Child Health Trust in Calcutta to support teaching and research in pediatrics by the purchase of equipment and supplies for the basic science departments and towards the further development of the institute's library. The foundation granted $21,000 for the development of the hospital record system at the Medical Record Library of the Christian Medical College at Vellore, and $100,000 was granted to the All-India Institute of Medical Sciences in New Delhi for teaching and research equipment. Although its plant has not yet been completed, the institute has been conducting undergraduate medical classes and a limited graduate program in orthopedic surgery since 1956. In the undergraduate program it stresses seminars and practical work by students as educational methods and emphasizes an integrated biochemical and physiological approach to medicine.

Prednisone for Tuberculosis.—P. K. Chatterjee and co-workers (*J. Indian M. A.* 31:6 [Sept. 16] 1958) gave prednisone to three men and one woman with tuberculosis who did not show radiologic improvement on specific chemotherapy alone. Two patients were acutely ill, one of them having a rapidly progressive tuberculosis of the cervical axillary and mediastinal lymph nodes with a segmental lesion in the lung. The others suffered from advanced pulmonary tuberculosis. Chemotherapy was given in either of three combinations—dihydrostreptomycin and PAS, dihydrostreptomycin and isoniazid, or PAS and isoniazid. The dose of prednisone varied from 1 to 2.5 mg. daily, given for a period of two and one-half to four months. The ages of the patients varied between 19 and 31 years. Three of the patients showed a marked improvement clinically and radiologically in the course of therapy with prednisone, and this improvement continued even after the hormone was stopped. The fourth patient had chronic nodular lesions and had relapsed three years after an apparently successful treatment with antituberculosis agents for one year. He did not respond to the combined therapy with prednisone and antituberculosis agents. None of the patients showed any side-effects with the small dosage used. The authors suggested that the anti-inflammatory action of corticosteroids may be of use in the treatment of actively ill tuberculous patients as they would control the toxicity and the rapid progress of the disease, if they are given in small doses and along with chemotherapeutic agents.

Filariasis of Scrotum.—U. S. Arora and co-workers (*Bull. Calcutta School Trop. Med.* 6:1 [Jan.] 1958) made lymphangiograms of 18 patients with chronic filarial lymphedema of the scrotum, their ages varying between 18 and 58 years and the duration of the disease varying from 6 months to 10 years. The edema was soft and piting in 13 and hard and nonpitting in 5. A 70% iodopyracet solution was injected into the lymphatics after they were made prominent by injection of patent blue-V subcutaneously and distal to the site of exploration. Roentgenograms were taken immediately and two, five, and eight minutes after injection of the dye. The lymphatics were well visualized in the 13 patients with soft edema. They were dilated and larger than normal, the dilatation being most marked in the early cases. Those with advanced disease showed saccular dilatation with sudden narrowing centrally, but in the five late cases of indurated edema, the lymphatics were poorly visualized. In the early cases, tortuosity and intercommunication of the vessels were also evident. The lymphatics showed absence of valves and retrograde flow of the fluid. The site of obstruction was on one or both sides and at or near the inguinal lymph nodes. Thus, as the condition progressed, an initial dilatation of the lymphatics occasioned by proximal obstruction was followed by sclerosis of the vessels leading to patchy filling appearance radiologically as was seen in the five patients with hard edema. The nonfunctioning of lympatics due to dilatation and later sclerosis lead to accumulation of tissue fluid rich in protein which caused hypertrophy of fibrous tissue and increase in size of the part involved.

Epidemic Encephalitis.—Sidhu and Taneja (*Indian J. Child Health* 7:9 [Sept.] 1958) stated that an epidemic of encephalitis broke out in Northern India in the summer of 1954, declining gradually by the end of September. Of those affected 80% were under the age of 5 years. Mortality was high, 50% of the deaths occurring within 48 hours of the onset. Routine laboratory investigations showed no specific abnormality, while the spinal fluid showed an increase in proteins and cells in some of the patients but no organisms. Postmortem examination showed evidence of early viral involvement, but virological studies on the paired serums, stool specimens, and autopsy material did not provide any clue. Evidence of antibodies against B3 Coxackie virus was found in six serum specimens while ECHO viruses were found in a few stools. By March of the next year 30% of the patients discharged from the hospital after the illness showed some type of neurological residuals. The authors observed such residuals in 109 survivors from a total of 231 patients who had encephalitis. Of the survivors, 73 had been discharged as cured and 36 had residuals at the time of discharge. The highest incidence of residuals was in the age group 0 to 2 years, the incidence diminishing with age.

Of the 36 patients 4 died during the follow-up period. Three of these had severe progressive paralysis agitans, and one had hemiplegia with recurrence of convulsions. Of the patients discharged with residuals, 15 were fully recovered within two months and 14 had partially recovered. The types of neurological residuals observed included paralysis agitans, upper motor neorone paralysis, facial palsy, mental defects, emotional disturbances, cerebellar dysfunction, choreoathetoid movements, generalized tonic spasms and rigidity, blindness, irritability, crying attacks, petit mal, aphasia, and neuritic pain. Upper motor neurone paralysis was seen in 13 and paralysis agitans in 12. Complete mental deterioration was present in four and irritability and emotional disturbances in nine. Patients with mental defects showed associated residuals such as paralysis agitans, blindness, and upper motor neurone paralysis. At the end of the follow-up period, 14 of the 29 patients still had some neurological defects. None of the extrapyramidal type of residuals persisted, these patients either dying or recovering fully. In 7 of the 13 with upper motor neurone involvement, paralysis persisted, but the commonest residual noted was mental retardation, present in 12. Irritability, present in nine at the time of discharge, disappeared in all, but emotional disturbances were still present in two. Of the patients discharged originally as cured, six had some postencephalitic sequelas. Lumbar pneumoencephalography done in patients with residuals showed positive evidence of cortical atrophy in 11.

UNITED KINGDOM

Physical Activity, Fat Intake, and Blood Coagulation.—McDonald and Fullerton (*Lancet* 2:600, 1958) showed that the coagulability of blood, measured by the recalcified plasma clotting time (R. C. P.), increases after the ingestion of animal fat in the form of bacon, butter, and eggs and also after the ingestion of such vegetable fat as margarine. The increasing mortality from coronary artery disease has followed changes in vegetable fat intake more closely than the alteration in animal fat consumption. The authors also considered that the increased mortality from coronary disease runs parallel with the general decline in physical exercise, which has taken place owing to the increase in mechanization of industry and transportation. Consideration of these facts led them to examine the effect of physical activity on the increase in blood coagulability which follows the ingestion of a fatty meal.

After their R. C. P. time had been estimated, 16 healthy men were given a meal containing 85 Gm. of animal fat and the estimation repeated after three and one-half hours, during which they were comparatively inactive. On another day the same type of meal was taken, but the subjects walked for six miles before the R. C. P. was estimated. During the inactive period the mean difference between the fasting R. C. P. and that found three and one-half hours after the meal was 23.8 seconds. After the six-mile walk the corresponding figure was 7.3 seconds. In another test the authors found that animal and vegetable fats in equal amounts produced about the same increase in blood coagulability. The hypothesis that the incidence of coronary disease is related to a low level of physical activity accords with these findings. If shortening of the R. C. P. can be regarded as indicating a greater tendency to fibrin formation in vivo, and if intravascular fibrin formation is the important factor leading to atheroma, it follows that any factor which operates over long periods, and which can be shown to shorten the R. C. P., is likely to be causally related to the development of atheroma. Two such factors are a high fat intake and a low level of physical activity.

Minamata Disease.—An unusual neurological disorder caused by eating contaminated fish, known as minamata disease, was described by McAlpine and Araki (*Lancet* 2:629, 1958). The disease takes its name from a small industrial town near the southwest coast of Kyushu, Japan. The effluent from a large artificial fertilizer factory empties into Minamata Bay. A mysterious nervous illness recently began to affect villagers near the bay, assuming epidemic proportions within two years, and causing death in more than a third of the victims and serious disability in most of the survivors. Concurrently, a fatal illness affected domestic animals, scavenging crows, and fish in a nearby bay. It was established that eating fish was associated with the occurrence of the disease and that fish responsible for the outbreak were caught in Minamata Bay. Chemical analysis of silt from the bay suggested that the water was polluted by effluent from the fertilizer factory. No fresh case has been reported since fishing in the bay was banned. The onset of numbness in the limbs and around the mouth of those affected suggested peripheral nerve involvement. In a few patients the numbness became generalized and was accompanied by sensory ataxia. Cerebellar symptoms were conspicuous at the onset, and pyramidal signs were sometimes observed. Not infrequently there was deafness and disturbance of vision, with constriction of the visual fields. In the more seriously ill patients there were mental confusion, stupor, coma, convulsions, involuntary movements, and insomnia. In some the presence of intellectual deterioration, mutism, epilepsy of late onset, limb spasticity, and incontinence suggested a form of progressive neuronal degeneration. Some of the neurological features of Minamata disease have been observed in toxic states due to certain metals, particularly thallium. It is conceivable that this is in the factory effluent, which is still being examined.

Acute Respiratory Disease in the Royal Air Force.—Acute respiratory disease in military personnel is a serious problem, since not only is time lost in training, but a substantial number are invalided with serious lung damage. Respiratory infections are serious in air crew because of the effect on the middle ear at high altitudes. McDonald and coworkers showed that in the Royal Air Force the incidence of acute respiratory infection is highest in the recruit units (*Brit. M. J.* 2:721, 1958). The major cause of invaliding in the R. A. F. for respiratory disease is illness contracted at recruit camps. Time spent at these stations represents at most 8.3% of the total service, whereas about 67% of all illness leading to this type of medical discharge is acquired during this period. The adenoviruses and influenza account for at least 50% of the illnesses during the severe and protracted winter epidemics in recruit stations. In nonrecruit units, as in the adult civilian population, the adenoviruses do not appear to be a frequent cause of illness. Although many outbreaks are due to influenza virus, the cause of a relatively high proportion of acute respiratory disease requiring hospitalization is unknown. Influenza A virus accounted for about 12% of the patients admited. Adenovirus infection probably spreads rapidly under the conditions in a recruit camp, with its quick turnover of young men drawn from all parts of the country. More than 50% of those invalided from the R. A. F. with a respiratory disease, other than tuberculosis or cancer, were discharged as a result of an acute respiratory disease contracted in their recruit training period.

CORRESPONDENCE

AID FOR PHYSICIANS

To the Editor:—In the year 1849 the South Carolina Legislature passed an act creating "The Society for the Relief of the Families of Deceased, Disabled and Indigent members of the Medical Profession of South Carolina." The purpose of this society as stated in the act of incorporation is as follows:

"And be it further enacted by the authority aforesaid, that the principal end of the said corporation shall be, to succor and maintain, and relieve the families of deceased and disabled indigent members of the Medical Profession of the State of South Carolina, members thereof, in such manner, and according to such rules and regulations as they may see fit to establish."

For 109 years, except for the years of the war between the states, this small group of physicians have contributed from their meager funds a "bounty" to wives and children of less fortunate colleagues. I would appreciate information concerning other such organizations that may be in existence in this country. It is believed that the South Carolina society is the oldest in America. It would be interesting to know if this is true. It has been learned that there are so-called benevolent organizations of this character in New York, New Jersey, Massachusetts, and California. I would be grateful if I could be furnished a list of such society's with the addresses of all of the officers. It would be interesting to compare policies and experiences.

W. Atmar Smith, M.D.
151 Wentworth St.,
Charleston 6, S. C.

ANTIPYRETIC EFFECTIVENESS OF ASPIRIN AND SALICYLAMIDE

To the Editor:—A paper comparing the antipyretic effectiveness of aspirin and salicylamide was published in The Journal (167:1821-1826 [Aug. 9] 1958). The authors throughout the article appear to concede the superiority of aspirin as an antipyretic in pediatrics, but their conclusions would seem to favor a new proprietary preparation. It seems advisable to call attention to several faults in the article.

In the selection of patients for this study, 19% of the patients were under 6 months old, 46% were from 6 to 12 months, 27% were from 1 to 2 years, and only 8% were from 2 to 3 years of age. In view of the recognized instability of the temperature-regulating mechanism in infants under 2 years of age, the findings as a whole lose validity. A proper and more informative choice would have been a higher age group in young children where the fever vagaries encountered in infants could be avoided

In a similar connection, there was an unfortunate selection of a base-line temperature of 100.2-101.0 F (37.9-38.3 C) rectally, which in such young infants is inconsequential and in many instances is quickly remedied without medication. Had there been chosen, as a base, a minimum temperature of 102 F (38.9 C), as was done by Colgan and Mintz (*J. Pediatrics* 50:552-555 [May] 1957), the tests would have possessed much more significance and the authors' own findings would have demonstrated the superiority of aspirin as an antipyretic to even a greater extent. Moreover, a clear and precise definition of what the authors actually viewed as antipyresis would make the data more valuable.

It also seems advisable to comment on the dosage of the drugs administered to the test patients. The investigators used 2 grains per year of age of salicylamide and 1 grain of aspirin, only one-half this dosage, in spite of the fact that the generally accepted dosage for both these agents is equivalent (Sollmann, *A Manual of Pharmacology*, ed. 8, Philadelphia, W. B. Saunders Company, p. 742-743). Yet, the report reads in part, "The data seemed to indicate that aspirin could produce greater drops in temperature and control pyrexia of a higher degree than could salicylamide. . . ." In the summary all reference to the self-evident superiority of aspirin is omitted.

The authors have also expressed some opinions on the relative toxicity of salicylamide and aspirin, based on published literature. For example, they quote references to the effect that the LD$_{50}$ of salicylamide is double that of aspirin, implying that it is twice as safe. One of these references reports no original determination of the LD$_{50}$ of salicylamide at all but merely refers to several other papers. The results in these papers, as well as of more recent references, do not confirm the contention that the acute toxicity of salicylamide will be half that of aspirin in humans. What they do show is that it is unjustified to assume that there is any essential difference between the two drugs. The wisest position in this regard is that taken by New and Nonofficial Drugs, 1958, p. 306, which states that "the toxicity of salicylamide compares closely with other salicylates. . . ."

A more questionable viewpoint is expressed when the authors imply that the LD$_{50}$ of salicylamide in mice, without consideration of species variation, or he slope of the dosage mortality curve, can be readily projected to children to prove the extent of ts safety. Such crude estimates, based on rodent data only, are frequently unjustified and may lead to serious errors in the evaluation of toxicity.

Convenience of administration and patient acceptability are evidently the principal reasons why these investigators lean toward the salicylamide preparation. But it is obvious from their paper (and the dosages administered, 32, 64, 128, and 192 mg.) that they used a dosage form of aspirin other than children's aspirin, which is palatable and certainly acceptable to infants and young children as demonstrated by its widespread use. Since it is in 1.25-grain tablets, it is convenient for accurate administration. Nor does it have any of the grittiness complained of in the paper in question.

A. Bass, Ph.D.
Plough, Inc.
Memphis 1, Tenn.

EVALUATION OF DRUGS

To the Editor:—The article, "Factors Influencing Clinical Evaluation of Drugs," by Modell and Houde, in The Journal (167:2190-2199 [Aug. 30] 1958) was most interesting and important. However, a most significant factor in the appraisal of drugs should be mentioned in this connection, and that is timing. By timing, I am referring to the time of the year or season in which the test or study is being made, as it pertains to certain drugs. Specifically, let me refer to the hay fever remedies for which glowing reports are made each year in advance of the peak times of pollination. During seasons of comparatively low pollen counts, previous to these peaks, yet regarded as the hay fever seasons, the antihistamines, ephedrine, and even the steroids are extolled in the most glowing terms. But, when the heights of the pollen seasons arrive, symptoms of hay fever and asthma occur in numerous patients and in many with a severity as great as if these drugs had not been used. The point is that the results claimed for the drugs were based on wrong timing. The studies should have included the peak of the pollen seasons.

In 1938 Bloom (*J. A. M. A.* 111:2281-2283 [Dec. 17] 1938) reported excellent results in hay fever with potassium chloride; this remedy was rapidly taken up throughout the world and was even regarded by some as a "cure." However, when I clinically tested a large group, at the crucial time, potassium chloride proved a failure and has since practically disappeared in hay fever therapy. Another example was ascorbic acid. Most drug stores had posters prominently displaying the virtues of vitamin C for allergy. A similar study disproved its value when administered at the peak time (Engelsher, *J. A. M. A.* 126:318 [Sept. 30] 1944). Timing, therefore, is a most important point in appraising drugs, especially those used for hay fever.

David L. Engelsher, M.D.
178 Mount Eden Ave.
New York 57.

ISONIAZID TOXICITY

To the Editor:—I wish to comment on Dr. Ross' article entitled "Use of Pyridoxine Hydrochloride to Prevent Isoniazid Toxicity" (J. A. M. A. 168:273-275 [Sept. 20] 1958). Contrary to what Dr. Ross concludes, I believe it is fair to assume that the issue of whether or not pyridoxine, which is at least in part transformed into pyridoxal in vivo, interferes with the antimicrobial action of isoniazid is settled. It does interfere. Not only has this phenomenon been observed in vivo in mice by McCune et al, but also we have observed a small but difinite antagonistic effect some time ago in performing microbiological assay studies for isoniazid in serum from patients given pyridoxine with isoniazid.

However, what Dr. Ross failed to emphasize—and I think it is most important—is the quantitative side of this phenomenon. Simple arithmetic calculations from the data presented by McCune will reveal that it took enormous doses of pyridoxine to antagonize isoniazid's chemotherapeutic activity, on a weight for weight basis; indeed, the proportion of pyridoxine to isoniazid used in McCune's studies is more than 100-fold greater than the proportion which has been shown to be clinically effective in preventing peripheral neuritis. It is so much greater that Dr. Ross' statement that "it appears wise to use isoniazid without pyridoxine in the routine treatment of tuberculous patients in clinical practice," seems unjustified.

Finally, in view of the many reports and publications concerning the wide variation in rates of metabolic inactivation of isoniazid among different patients, it seems surprising not to see reference in the article to the point of view which we expressed some time ago (Carlson, H. B., and others, *New England J. Med.* 255:118-122 [July 19] 1956), namely, that those patients (some are certainly encountered in the routine treatment of tuberculosis in clinical practice) who metabolize isoniazid so rapidly that standard dosages of this drug may not be therapeutically adequate, should receive pyridoxine when the indicated dosage of isoniazid is higher than 5 mg. per kilogram of body weight per day.

G. Middlebrook, M.D.
National Jewish Hospital
Denver, Colo.

MISCELLANY

MISSILES OR PENSIONS

Louis M. Orr, M.D., Orlando, Fla.

If you have ever watched a film of a rocket ascension, you will notice that the rocket starts out slowly and somewhat unsteadily, building up speed as it rises. It is during this first, slow acceleration that the flight can be cancelled by adverse winds and the rocket grounded.

There is a parallel with our nation's present venture into deficit financing. Each year our budget is a little higher, a little broader. Each year the federal government gets a little deeper into more programs which should be locally organized and administered. For part of each year the United States government, the government of the richest nation on earth, lives from hand to mouth, with only enough money in its treasury to pay next month's expenses.

Almost every year, Congress debates raising the statutory debt limit.

But this is only the beginning of the rocket's flight. Each new federal program starts out small—but each program not only grows itself but also gives birth to further programs.

Soon we will pass the point at which adverse pressure can slow or turn the flight—and then the rocket will really take off!

Our country has gotten so big that we tend to forget that we're supposed to be running it. Most of the time what goes on in Washington seems so far away from us that we either lose track or treat the Washington news like it doesn't concern us.

I expect my patients to take an interest in their treatment—after all, it's their health that will primarily be affected. And I feel very strongly that every taxpayer should take a personal interest in the actions of his government. After all, it's our incomes they're operating on.

I'm sure most of you have, at one time or another, run into the notion that doctors should stick to medicine—and leave running the country to the self-styled "experts." Well, strictly within my own field of competence, I know that it is unhealthy for a man to keep living beyond his physical means. No man can go on, year after year, getting less sleep than he needs, less food than he needs, without serious deficiencies. Psychologically, too, as a doctor, I know that it is unhealthy for a man to live in a state of constant debt, spending more than he is making. If he worries about his debts constantly, the strain is bound to affect him. And if he doesn't worry about his debts, that's even worse.

Our government is living beyond its economic means; it has already accumulated a good deal of excess fat in the form of programs which either should not be government responsibilities at all or should be handled at the local level. Even if my voice is not heard as a taxpayer, as a physician I say this is an unhealthy state for our nation to be in.

I am not going to try to cover all the economies possible in our federal government. Instead I am going to talk about the savings possible in just one agency of the government—the Veterans' Administration. And how much could be saved by merely taking the VA out of programs which are really not its proper field? In the next 40 years we could save over 80 billion dollars.

As you are well aware, medicine is intimately involved in welfare programs. You might say that we have a vested interest. This welfare may be as simple as the giving of a relief check to a man because he's too sick to work or it may include full hospital and medical assistance. Federal agencies acknowledge medical care as an integral part of welfare—so much so that medical care programs for the indigent now receive special support and encouragement. So the medical profession has an interest, a very special interest, in federal welfare spending—a professional interest, in addition to our interest, as taxpayers, in how our money is spent.

The medical profession views with a particularly jaundiced eye the constantly increasing federal intervention into the private lives of our citizens. We must be free to practice our art and science to the limit of our own ability—not to a set of rules and regulations compiled in Washington. This is why the medical profession keeps a constant and watchful eye on federal spending in the health and medical care fields.

I happen to be chairman of the American Medical Association's Committee on Federal Medical Services, a committee of the Council on Medical Service. This committee is only one of several A. M. A. departments which keep track of new developments in federal medicine.

In recent years, we have found the Veterans' Administration welfare and medical program to be one of our greatest causes for anxiety. For the past five years, the American Medical Association, the state associations, and the individual physicians have been saying, "It is time to call a halt, time to consider where we are heading—and whether we really want to go there."

This is one of the programs on which we must set a brake—now, while it may still be possible—before it takes off into outer space.

Why are we so concerned with this one agency? Surely, we physicians would not deny that our nation's veterans have a right to our help? We are concerned for a number of very serious reasons:

Vice-Speaker, A. M. A. House of Delegates.

Read before the 15th Annual Meeting of the Delegates and Assembly of the Association of American Physicians and Surgeons, April 10, 11, 12, 1958, San Francisco.

First, the VA's programs provide federal aid directly to individual citizens. Most federal aid programs work through the states, such as Public Assistance or Hill-Burton—they are grants-in-aid, funds to help the state carry out a program. But the state has no voice in the VA's operations, nor has the county or the community.

This program short-circuits the whole American system of local control and local responsibility for the individual's needs. It is a prime example of direct central government, which the people can control only through Congress and the President.

In the absence of local control, confusion results. A good example is in the administration of the Hill-Burton program, through which the federal government makes grants to the states to help in the construction of local hospitals.

When submitting plans for proposed hospitals a state is required to estimate the number of citizens, including veterans, that the new hospital will serve. On the other hand, when counting the number of existing beds in the state, they are not allowed to include those beds in VA hospitals.

So, the veterans get counted twice—once to determine where VA beds are most needed and once to determine where Hill-Burton beds are most needed.

We believe that such confusion and duplication could be eliminated if government programs were under local control where we can see what's going on.

Second, the VA is turning many of our veterans into government wards. It saps their initiative by giving them the soft cushion of federal money to fall back on, and decreases the community's feeling of responsibility for its own members.

The medical profession is not accusing all veterans, or even large numbers of them, of dishonesty or malingering.

It is true, however, that there are men, who if offered free medical care or a lifetime pension, will not make any great effort to refuse it—even though they have suffered no injury from their military service to earn it.

Third, as physicians we are concerned because this program has brought into existence one of the largest chains of government-owned hospitals in the world. Anyone who has the interest of his community's hospitals at heart should be concerned. America, of all nations, knows the competitive advantage chain purchasing can give—and many a local hospital has felt the press of VA competition for medical and nursing personnel—and even for patients.

Fourth, and this should concern all taxpayers, the VA has now one of our government's largest spending programs, outside of defense costs—and it is still going up. If we do not change the program now, its cost will reach almost 5 billion dollars a year by 1960. By 1985, under present laws, it will be costing us 6 billion dollars a year—and that will keep on until the end of the century, at least.

By the year 2000 we could well have half our population paying billions of dollars in welfare benefits to the other half. We could have a federal hospital system two or three times as big as our present one, draining off medical personnel from the rest of the population.

The American taxpayer is long-suffering—but how long could the nonveteran population stand this pressure.

The enormity of our future obligations can best be seen by looking at the past. In the period immediately following World War I we had 4 million new veterans in the nation.

There were about 26,000 government hospital beds available for treating veterans with service-connected disabilities—and 9,500 of those beds were empty. What resulted?

First, the hospital beds were opened to any veteran—with or without service-connected disabilities. This benefit was cut during the Depression, but reinstated almost immediately—leaving the present situation, where a veteran who suffered no harm from his military service can get free hospital care when a bed is available—just by stating that he cannot pay for care.

Next, pensions were authorized for World War I veterans with non-service-connected disabilities rendering them unemployable, and for their survivors.

Under present laws, these pensions will eventually cost the nation over 30 billion dollars for World War I veterans. This is more than half the cost of all benefits granted these veterans—and more than the 26 billion dollars the war itself cost us.

Today, instead of some 5 million veterans—from World War I and earlier wars—we have over 22 million. Instead of 26,000 hospital beds, we have 129,000 beds—and less than 42,000 patients being treated for service-connected disabilities.

How much will our two "new wars"—World War II and Korea—cost us in veterans' benefits?

Under present laws, it is estimated that World War II will cost almost 110 billion dollars for pensions and over 123 billion dollars for other benefits; Korea will cost us 53 billion dollars in pensions and 26 billion in other benefits.

That is a total of almost 312 billion dollars for these two wars—371 billion for the veterans of World War I, World War II, and Korea. This is a debt of over $2,100 for every man, woman, and child in the United States today.

And almost 300 billion dollars of that cost is still ahead of us! These are huge figures we are dealing with. Too often their immensity is not real to the average citizen.

True, from Washington we hear talks of budgets and appropriations which soar into millions and billions of dollars. But, in our normal every day living our economic world is one of dollars, half dollars, quarters, nickles and yes, even pennies. The astronomical cost of veterans' benefits are almost as hard to grasp.

Maybe it would be easier to "get the feel" of these costs in terms of individual veterans—almost $13,000 for each of the 5 million who served during World War I, plus $14,000 for each of the 16 and a quarter million who served during World War II—and almost $15,000 for each of the five and a third million who served in the Korean conflict.

Or almost $14,000 in federal money to each of 26 and a half million men—one out of every six persons in the United States.

Do you remember the old poem about the blind men and the elephant? It used to be in almost every school reader—how one man felt the trunk and said "It's like a snake" and another felt a leg and said "It's like a tree" and another felt a side and said "It's like a wall."

Sometimes, approaching something as vast as the Veterans' Administration, I feel a little like one of those blind men. This is almost too big to see *all* at once. You have to take a view from one side—and then from another—and then from another—and *only* when you put them all together do you begin to get an idea of the whole picture.

VA costs, for instance—maybe their size will come clearer if I take just one more aspect—How big a bite do they take out of the budget each year?

In 1920, veterans' benefits were small change—by modern standards—less than 500 million dollars a year—rising gradually to 744 million in 1944.

But in 1945, as the first wave of World War II veterans hit, costs jumped to 2 billion dollars,—in 1946, to almost 4½ billion, and in 1947 to 7½ billion.

They stayed over 5 billion dollars until 1951, then dropped to a little over 4 billion in 1954.

But now the cost is on the rise again. Let me repeat—by 1960, the VA will be spending almost 5 billion dollars a year—and the cost will continue to rise to 6 billion dollars a year by 1985—and will stay close to that figure until the end of the twentieth century.

These astronomical figures are all based on the continuance of presently existing laws.

Should a general service pension be enacted for veterans of these three wars—as was enacted for veterans of earlier wars—veterans' benefits could cost us over 760 billion dollars—more than double the cost we now face.

In the face of this already frightening financial burden promised by our laws, it seems almost cruel to project additional increases—but, as a doctor, I must point out that these figures do not allow for any significant increase in the Veterans' Administration's hospital system.

Yet, unless we act now, the medical care program seems very likely to increase—and for the same reasons that the pension program will increase.

We have two great classes of veterans' benefits—the service-connected and the non-service-connected. The service-connected benefits are those intended to aid the veteran who was actually injured in some way—mentally, physically, socially—by his military service. I am including here those readjustment benefits like unemployment compensation and educational benefits which are intended to help the veteran in his initial readjustment to civilian life.

The non-service-connected benefits are those granted to the veteran who suffered no harm from his military service. It provides him with assistance in difficulties which are a common civilian hazard—like illnesses and disabilities resulting from everyday life—and which have nothing to do with his military service.

It is obvious that the greatest demand for service-connected benefits will come in the period immediately following a war. The bulk of compensation payments for service-connected disabilities will begin then, and gradually drop off as the veterans and their survivors die. The bulk of service-connected hospital care will at least begin during these years, even for the long-term cases.

But when does the demand for non-service-connected benefits show up?

As the veteran grows older—and more infirm; as he becomes less able to pay his own way; as the diseases of age catch up with him.

That is why the VA's costs are beginning to rise. Today pensions cost nearly half as much as compensation; by 1965 they will exceed compensation—and by 1985 pensions will cost over three and a half billion dollars—more than all other VA costs put together—and the case-load will include three *and a half million veterans and veterans'* survivors.

This change can have its effect on VA hospitals, too.

Today, almost two-thirds of the VA's patients are being treated for non-service-connected disabilities. Every applicant on the VA's waiting list wants treatment for a non-service-connected condition.

In January, 1956, there were 20,000 applicants waiting—in January, 1957, 22,000—and in January, 1958, 24,000. And not one a service-connected disability.

Can you see the pressure mounting for more VA hospital beds as this waiting list mounts? As our World War II veterans become older and begin to suffer the ravages of time—which affect non-veterans as well—can you see Congress being besieged with demands for "more VA beds for my State"—or your state—or yours?

Every last man of our 22 million veterans is eligible for VA hospital care, if he needs it, as soon as he signs the statement that he is unable to pay. The only limiting factor left is the number of beds empty.

How many veterans are going to find it easier and easier to sign that statement as they get older—and more frequently sick?

We have already built 80,000 hospital beds whose obvious purpose is to provide more "available beds" for the non-service-connected ill. We have no legal ceiling on the size of the VA hospital system.

How long, with this mounting pressure from the states, will the VA stay its present size?

How can we save this country from the mounting costs of veterans' benefits? Very simple:

First—apply realistic standards to the compensation program;

Second—even if we do not eliminate pensions, at least make them supplementary to instead of duplicating the income maintenance programs for the whole nation;

Third—return the VA hospital system to the job it was set up to do—the care of service-connected disabilities.

I have no quarrel with the idea behind the compensation program—the veteran who is disabled as a result of his military service is entitled to compensation for that disability. However, the disability rating and award program, as it stands, is unrealistic and full of inequities.

For example, there are men drawing 10% and 20% disability checks monthly for life who are disabled only nominally—actually, they are holding down full-time jobs. If these cases were settled on a lump-sum basis, the annual compensation load would be decreased over 300 million dollars per year.

There are veterans whose compensation is based on a legislative presumption of service-connection—rather than evidence. There are veterans receiving statutory awards for a particular type of disability, which results in their receiving more compensation than a man who is rated as more severely disabled. There are members of veterans' families receiving survivor benefits who were not actually dependent on him—and survivor benefits are provided through eight different federal programs.

Fifty-seven per cent of the compensation cases are in the 10 and 20% disability category. Adoption of lump sum payments, revision of the rating schedule to reflect actual service-connected disability and coordination of the overlapping and duplicative survivor benefit programs—plus the obvious savings in administrative overhead—could save some 9 billion dollars in the next forty years.

The greatest savings can be made, however, through revising the pension program—and it should be emphasized again that pensions are payments for non-service-connected disabilities. They have nothing to do with military service—except that veterans can get them and nonveterans can't.

Further, these vast costs will be doubled—to over 700 billion dollars—if general service pensions should be enacted.

How do we avoid this huge cost? Simply by making the pension system, as the Bradley Commission suggested, "a reserve line of economic defense" for the needy veteran or his survivors—until their needs are met through OASDI or other available sources of regular income.

You see, the situation has changed vastly since the Twenties, and not only in the size of the veteran population. Then, a needy veteran had few resources except special pensions. Today, the Old Age, Survivors, and Disability Insurance (OASDI) program covers more than 80 per cent of the men over 20—and veterans receive social security wage credit for time spent in uniform. In 20 years, almost all veterans will be covered.

In addition, there are now other federal retirement programs, industrial retirement plans, insurance programs covering medical care, disability and retirement. Pensions are no longer the only source of funds for the needy veteran.

In fact, a 1955 survey showed that almost half the over-65 VA pensioners were also receiving OASDI benefits. The veterans without dependents averaged $550 a year from OASDI; those with dependents averaged $659.

By coordinating VA and OASDI payments, and setting the total payment to a veteran at a level consistent with need standards set by local governments—we can reduce pension costs by over 70 million dollars annually for those over 65.

When we take into consideration the fact that OASDI benefits are now available from the age of 50 for the totally disabled, this coordination could save about 158 million dollars a year.

By carrying this coordination and revision of the payment schedule over to the survivor pension program—and paying these pensions only to those who need them—we could make an additional immediate saving of over 80 million dollars a year.

The pension load is increasing—and will continue increasing to the end of the century. With the anticipated case-loads, adoption of these suggestions would cut pension costs 68 billion dollars during the next 40 years. With the savings on the compensation program, we could save a total of 77 billion.

If this reappraisal—and revision—staved off the calamitous specter of a general service pension, we would save almost 250 billion dollars. This is almost as much as the present total federal debt.

And, of course, these estimates are only—only—*until the end of this century.*

Survivor benefits are still being paid to over five thousand dependents of Civil War veterans; the last survivor benefit for the War of 1812 was paid in 1946—131 years after the war ended.

How much would be saved by cutting down on VA hospitalization and returning the care of non-service-connected disabilities to local responsibility?

The Hoover Commission, in 1955, listed a number of hospitals which it found to be surplus to the VA's operations—even continuing non-service-connected care. Removing these hospitals from the federal expense account would save some 7½ million dollars a year. Limiting care provided to service-connected cases would, according to the Commission, save another 150 million dollars per year.

It is my personal opinion that this is probably a great understatement of the savings that could be made in this program. Just to give one indication—the VA itself reports that inpatient care at its hospital cost 624 million dollars in 1956—and that only 36% of the daily load was service-connected. Gradual elimination of the two-thirds of the patient load which is non-service-connected would be more likely to result in a saving of almost 400 million dollars; or 16 billion in 40 years.

However, even keeping to the Hoover Commission estimates, we could save 6 billion dollars more by returning the VA hospitals to the service-connected patient.

These three changes—in compensation, in pensions, in hospitalization—would, then, result in a saving of about 83 billion dollars in the next 40 years. How much more it would save by keeping off our backs new pension programs, more VA hospital beds, more federal control of medicine, and more federal intervention in local responsibilities is impossible to estimate.

I have chosen only three of the VA's programs to exemplify the savings possible in this agency—but I would like to try to give you some indication of what a colossus it really is. The blind man has talked about the trunk and the leg of the elephant—but the elephant has other features as well.

Here's just a brief run-down: The VA, in 1956, provided out-patient care for over two million veterans; provided domiciliary care for an average of 17,000 veterans daily; did research into tranquilizers, blood diseases, cancer; distributed and did research in prosthetic appliances, provided vocational rehabilitation training for half a million veterans; received 600,000 applications for loan guarantees; acted as guardian for 348,000 beneficiaries; helped support the Philippine Veterans Memorial Hospital in Manila; and insured almost 6 million veterans under NSLI and USGLI policies.

The VA employed over 176,000, including 146,000 in its medical programs, and spent over five and a half billion dollars. It had 2,300 residents—almost 1,400 in general surgery and internal medicine.

I know I am beginning to sound like the World Almanac—and I don't expect any of you to memorize all the facts and figures which have been wheeling around your head for the past half hour.

I do hope I have left you with some idea of how huge the Veterans' Administration—which should be concerned primarily with the needs of some three million veterans with service-connected disabilities—has become. Medical research programs, residency training, free hospitalization for all veterans, pensions for unemployable veterans, insurance, guardianship, atomic research, loans—that's an awfully large number of pies to have fingers in!

It should be obvious, I believe, that we have abdicated much of our local responsibility to this one government agency. The question is—when will it stop?

Where do we go from here? I see, and I hope I am right—the American people rising up and taking over the United States government again, putting it back on the rails—and out of all the places it doesn't belong.

As a taxpayer, I say we should stop and reconsider before we are bankrupt. As a doctor, I say we should stop before this unhealthy condition turns into an incurable illness. As an American, I say we should stop before we spend away our liberties—either by the federal government buying them from the states—or by not leaving enough cash in the account to pay for defense against our enemies across the ocean.

The rocket has almost reached the stratosphere. The time to stop it is now before the ascension becomes unstoppable—short of an explosion. It can be done—but not without your help.

BUSINESS PRACTICE

This is the sixth in a series of excerpts from the brochure on the Business Side of Medical Practice, prepared by the American Medical Association in cooperation with the Sears-Roebuck Foundation.

WHAT INSURANCE SHOULD A DOCTOR CARRY?

Insurance is of vital importance to you, especially so if you are in private practice. Articles on the subject appear frequently in many of your professional journals. How to protect yourself from the various hazards inherent in the practice of medicine is a matter which should receive thorough consideration.

Insurance is a broad subject and has many ramifications—far too many to try to cover them all here. This summary treatment is included primarily to call these matters to your attention and to provide a basis upon which to plan your insurance program in light of your personal and professional circumstances.

Property and liability insurance should be looked upon as protection rather than as an investment. It is designed primarily as a means of safeguarding against financial loss, and, as such, it performs a vital function in our economy.

Insurance should provide for self protection, employee protection, and the protection of the family. Self-protection insurance can be divided roughly into the following classifications: protection against liability; protection against loss caused by fire and theft; and protection against loss of or lowering of income due to disability caused by sickness or accident.

Liability

Generally, liability may be of two types. One may result from the actual practice of medicine (professional liability), and the other may rise by virtue of owning or leasing property, including office and ownership or operation of automobile, as well as liability which could result from personal activities which are not in any way related to the practice of medicine.

Professional Liability.—Among the significant hazards involving the medical profession are the claims and legal actions for alleged malpractice. Each year, according to some estimates, about 5,000 suits are instituted and an unknown number of claims are settled out of court. Practically every one of these incidents has its detrimental effect on the profession as a whole, undermining public confidence in the profession and sometimes in the physician himself. In the absence of such insurance protection, the doctor might be obligated to pay damages, court costs, including his attorney's fee, and many other expenses in the event a suit is decided in favor of the plaintiff. As a result, many a physician's career could well end in bankruptcy. Even though the physician is declared innocent of any malpractice, the costs incident to investigation and defense, coupled with attendant loss of earning, can be burdensome.

The mounting number of claims involving liability of all types, together with spiraling judgments, has resulted in increases in the premiums for this type of insurance. Insurance is based on averages. Premiums vary according to what the insurance companies have had to pay out in claims plus the costs of doing business. Physicians can contribute toward lowering premiums by a disciplined program of claim prevention.

The potentiality of a threatened claim or suit alleging malpractice is one of the hazards of medical practice. In view of this, every physician is well advised to be ever mindful of this and take due precautions to avoid those situations which result in poor patient-physician relationships. Although by no means complete, the following suggestions are among those mentioned most frequently by medicolegal authorities which should minimize patient-physician problems and also reduce the possibilities of suits or claims. To a large extent, these may well be helpful in defending a claim or suit should you become so involved:

1. Make a special effort to satisfy the patient during all phases of diagnosis and treatment—a new patient dissatisfied with an initial treatment tends to brood, tell others of his dissatisfaction, possibly including a lawyer.

2. If the fee for treatment might appear high to the patient, in the absence of an explanation of your services, discuss it frankly before you set it. "Surprising" fees are sometimes the springboard for malpractice accusations.

3. When in doubt about a diagnosis or alternative method of treatment, recommend that a consultant be called in. Enter this recommendation in the patient's file. In the event the patient declines your recommendation, ask him to sign a statement to that effect and keep the statements in your records. This protects two ways—it protects the doctor and leaves to the patient the responsibility for refusing consultation.

4. Do not guarantee a therapeutic result either directly or by implication. Explain the problem to the patient and the possible results. If his welfare requires a calculated risk, explain it in advance.

5. Be sure that all instructions to the nurse are completely understood. The nurse is normally con-

sidered to be the doctor's agent, and, if an error occurs in executing any instruction, you may be held responsible.

6. Remember that the telephone may be a booby-trap for both misdiagnosis and misunderstanding of instructions. Whenever possible, avoid giving a patient advice by phone.

7. Do not neglect or abandon a patient without serving reasonable notice. Whenever possible, make arrangements to have a colleague accept the responsibility of treating your patients when you are unavailable. Many physicians notify their patients in advance when they plan to be away for any length of time.

8. Familiarize yourself with your state laws concerning malpractice. Laws vary from state to state. You should also be informed regarding the limitations which specify the time within which legal action may be instituted.

9. Keep records which are accurate and up to date. If a complaint should be filed against you, never alter or destroy the records.

10. Should any incident occur which you suspect could lead to a suit or claim, you should give immediate notice to your insurance company.

11. During obstetric or similar examinations of female patients, be sure a nurse or other woman employee is present.

Professional liability insurance is available in each of the 48 states and territories. A number of constituent associations and component societies have so-called group professional liability insurance programs available to member physicians.

The limits of liability (per claim and for all claims during any one policy year) depend on many factors. Among them are type of practice—specialty or general—the economic level of the community, the claims consciousness of the people in the area and other factors.

In this matter it is best to consult your medical society and colleagues in the area. Even with the most skilled and careful physician, suits are possible and the doctor should protect himself with insurance that will take care of the expense if it should happen to him as well as to safeguard his estate in the event of an adverse judgment.

Public Liability

Any owner or leaser of property may be held legally responsible for an accident occurring on the premises which is attributable to his neglest. If a doctor leases a suite in a public building, his responsibility may be presumed to begin the minute the patient enters his office. If his office facilities include land and a parking area for patients, his responsibility may extend there also.

The incidence of such accidents is relatively low, and the physician may question the advisability of covering the possibility with insurance. The premium cost is modest, accidents do occur, especially where the public is concerned, and such coverage can save considerable financial embarrassment.

Automobile Liability.—Automobile liability is perhaps among the most commonly understood of all forms of liability protection, and it is not necessary to cover the subject here in detail, other than to recommend that the physician should carry adequate limits of coverage. It probably is better to carry too much liability rather than too little.

Also, the doctor should be aware that, if an employees uses his or her car in performing a service for the doctor and has an accident while doing so, the doctor may be sued as well as the employee. It is a simple matter to have the employee include the doctor as a coinsured in his or her policy. You should also consider coverage that will protect you while driving an automobile not owned by you such as one you may rent temporarily or one which may be lent to you. In addition to automobile liability, you will undoubtedly be interested in and wish to carry other elements of automobile insurance.

Fire, Burglary, Home, Theft, and Comprehensive Insurance

Whether fire insurance is secured for the office, the home, or both, it should include not only the building but the value of the furniture and equipment as well. The valuation is not normally based on the replacement cost but on the depreciated or actual sales value at the time. For this reason, an inventory of equipment and furniture should be kept current and in a safe place, preferably in the safe deposit box at the bank.

After a physician has been practicing for an appreciable length of time, his files, including accounts receivable, are very valuable property. Frequently these items are the least protected against fire or other loss. It is possible to carry insurance against loss of these records, but whether or not these records are insured it is recommended that they be kept in a fire-proof safe or vault when not in acutal use.

With burglary and theft insurance, the cost depends largely on the location of the office and the amount of money kept there. The amount of cash in a doctor's office may not be enough to warrant the expense of such insurance since many burglaries of doctors' offices are for narcotics rather than money. Although actual cash loss may be small the damage to the building and equipment can be substantial. A recent newspaper article describing a burglary of a doctor's office listed the loss as $5.80 worth of narcotics and an estimated damage to the furnishings and equipment of over $3,000. The loss and damage was covered by insurance. In buying this type of protection, it is well to include damage to property.

Comprehensive or "All Risk" Coverage.—Several facets of insurance incident to home ownership and operation of a professional office can frequently be consolidated. Many multiple line companies offer comprehensive policies which provide protection against a variety of hazards including fire, theft, and windstorm, as well as personal and public liability at a total premium charge which may be substantially less than the cost of the same insurance in separate policies. This is because such a blanket type of policy can be processed more cheaply by the company. It is worth considering when planning your over-all insurance program.

Accident and Health or Disability Insurance

The physician in individual practice is the sole income producer. Anything which keeps him from his practice for any appreciable length of time can be a serious financial hazard. Because of this, accident and health or disability insurance is attractive to him. Many insurance counselors consider this type of protection equally if not more essential than life insurance, since a period of disability entails support not only of the family but the disabled doctor as well. Loss of earnings may extend over months or years.

In considering this type of coverage, you should purchase it from a company which is licensed in the state and preferably through a local agent or broker. Perhaps this type of insurance is subject to more variables than other branches of insurance. Accordingly, sound advice and careful planning should prevail in arranging this phase of your insurance program.

Basically, this type of insurance is designed to replace a portion (not all) of your earned income in the event of disability due to accident or illness. Such insurance is available generally on a individual basis; and in some areas, group and franchise programs are available through professional organizations and associations.

Individually underwritten policies are of three general types: cancellable, guaranteed term, and noncancellable. The first type can be terminated by the company at any time. A guaranteed term contract is not normally subject to cancellation during any term for which a premium has been paid and accepted; however, the insurer may elect not to continue the contract on any renewal date. Noncancellable contracts are not only that but are guaranteed renewable at each premium due date up to a specified age. Fraud, or intent at fraud through misrepresentation of facts, however, may be considered as just cause for terminating a contract if resorted to, either in applying for insurance coverage or in claiming benefits.

The premium costs vary and are determined by several factors, such as type of contract (cancellable, guaranteed term, or noncancellable), amount of weekly or monthly indemnity, occupation or profession, age, sex, length of time for which benefits are payable, whether benefits are payable for nonoccupational disability or cover both occupational and nonoccupational illnesses and injuries, and the waiting period between the date of disability and the commencement of benefit payments.

All other factors being equal, premiums may be reduced considerably by selecting a policy which has a fairly long waiting period between the onset of disability and the time benefits start. Such waiting periods eliminate the necessity of paying for short periods of disability and the attendant administrative cost and conserve a correspondingly greater portion of the premium income to pay for longer periods of disability which are of more serious financial consequence.

The underwriting requirements of insurance companies differ, but most of them will not knowingly issue benefits which will approximate net earned income of the applicant.

In varying degrees physicians may, as mentioned earlier, participate in group or franchise disability insurance programs through membership in professional associations and societies. Although these programs have their merits, they may have to be utilized primarily to supplement rather than replace other coverage.

You should make sure that your health history at the time of applying for insurance is not misrepresented since most non-group contracts promise benefits only for disability resulting from accidents and illnesses that originate subsequent to the date the policy is issued.

Office Overhead Insurance.—When the doctor is incapacitated his office overhead goes on. Salaries, rent, utilities, and such must be met. To meet this contingency you may wish to consider a relatively new form of disability insurance which was designed for this specific purpose. Although underwritten like disability insurance, benefits are based on verifiable office overhead fixed expenses rather than earned income. This, as well as the cost of insurance protecting the physician against professional liability and against fire and casualty loss of office equipment and supplies, may be considered a business expense and deductible when figuring income tax. It should be noted, however, that the proceeds obtained from such insurance is considered taxable income.

Employee Insurance

Most states have statutory requirements regarding the responsibilities of an employer. Prior to the employment of another physician, a nurse, a technician, or receptionist, you would be well advised to learn fully what your responsibilities are. Workmen's compensation laws generally spell out the extent to which an employer is financially responsible for the death or disability of an employee as a result of an occupational accident or injury. Since the laws vary from state to state and their applicability often depends, to a degree, on the number of employees, you should make certain that you do not assume any hazards unnecessarily.

In some jurisdictions there is a state monopolistic fund which is the sole source of insurance for protection against workmen's compensation liability. In other states, the employer may select from a number of private carriers. The cost of the type of protection depends on several factors, but primarily upon the classification of employment and the amount of payroll.

Sources of information include the state agency which administers the law, your local medical society or state medical association, your insurance counsellor, and your attorney.

Many employers provide or make available, in addition to employee protection required by law, other forms of insurance for the benefit of their employees. These include life insurance, disability insurance, and hospitalization benefits. Some of these forms of coverage may be available as extensions of benefits offered to members of professional societies.

Life Insurance—Family Protection

Life insurance is primarily a form of protection for the doctor's family and possibly his creditors in the case of his death. Additionally, it can be a form of savings and can also be used to supplement a retirement program. The subject is so large that it could well be the subject of a special pamphlet. Although there are many different varieties of programs, the three most common types of policies are term, ordinary life and endowment, or annuity contracts.

Term insurance involves the lowest premium cost. Such contracts are usually issued on a level premium basis with coverage lasting only for the term specified. Most contracts provide that the policy holder may convert his coverage to a permanent plan of insurance, without evidence of insurability, provided such option is exercised within a prescribed period. This form of coverage is referred to frequently as "pure protection," since it does not normally include cash surrender or loan values.

Ordinary life insurance is the classification frequently given to contracts of a permanent nature, which do not usually include endowment or annuity features. Generally speaking, the policies provide for level premium payments throughout the life of the insured with the face amount becoming payable at death. There are modifications, however, whereby such coverage may be purchased on a basis that the insurance becomes "paid-up" either at a specified age or after the payment of premiums for a specified number of years. Although such policies become paid up at the designated time, the face amount is not normally payable until the death of the policy holder.

Ordinary life insurance policies usually contain guaranteed cash and loan values as well as provisions for extension of insurance for a stipulated length of time in the event premium payments are not continued. Thus, such policies contain an element of savings in addition to just insurance protection.

The third general category is known as endowment or annuity insurance. Such contracts contain both the features of insurance protection and savings. Under an endowment policy the face amount becomes due and payable at the end of the contract period. The face amount also becomes due and payable in the event the policy holder dies prior to the completion of the premium paying period. An annuity contract usually matures in the same manner as an endowment policy but, in addition, may provide for periodic payments (rather than a lump sum) to the policy holder in the form of retirement income.

There are varying combinations of the foregoing types of coverage which an individual can arrange for in his life insurance programing. Several professional organizations including constituent associations and component societies have established group and franchise plans in which physicians may participate. Life insurance planning should be done on an individual basis and the physician is well advised to utilize the services of a competent insurance counsellor. Insurance needs often change due to family and financial circumstances.

Since most permanent life insurance contracts provide for a great deal of flexibility, it may be advantageous to have your program analyzed periodically and modified, when indicated, so that it will fulfill, on a current basis, the purposes you intend.

Insurance is designed to protect you, your family, and your employees. It is an important consideration when establishing a practice, so devote enough time to it and secure advice that will enable you to develop an adequate insurance program.

MEDICAL FILM REVIEWS

This Is Nursing: 16 mm., color, sound, showing time 29 minutes. Produced in 1957 by and procurable on rental ($7.50) or purchase ($250) from Educational Film Sales Department, University Extension, University of California, Los Angeles 24.

This film demonstrates the scope of professional nursing activities in contributing to effective rehabilitation of the patient; it stresses that rehabilitation is dependent on coordination of all health workers rather than on one individual. Designed for nurses, physicians, medical students, and lay groups, it shows the teamwork needed in rehabilitation programs, with special emphasis on the nurse's role. It shows that rehabilitation takes time, professional skill, understanding, and contributions from many people, while at the same time the responsibility rests on the individual himself. Emphasis is on the team approach in dealing with the patient, and the film also shows that rehabilitation starts immediately on the patient's admission. It should make a valuable contribution for discussion purposes in nursing groups. Although they are not pictured as members of the team, dietitians and medical social workers should also be interested, since seeing the patient in the film would alert them to his problem.

NEW FILMS ADDED TO A. M. A. MOTION PICTURE LIBRARY

Helping Hands for Julie: 16 mm., black and white, sound, showing time 25 minutes. Cleared for television. Presented by the American Medical Association and the American Hospital Association. Sponsored as a public service by E. R. Squibb and Sons, Division of Olin Mathieson Chemical Corporation, New York. Produced in 1958 by Henry Strauss Productions, Inc., New York. Procurable on loan (no service charge) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film is designed to attract students to health careers by dramatizing their opportunities. The story revolves around Julie's fight for life when she is brought into the hospital emergency room—diagnosis unknown. Her family doctor, a surgeon, and a resident mobilize the entire medical team, and it swings into swift, disciplined, and decisive action. The helping hands aiding the doctors in this vital search for the correct diagnosis are those of nurses, medical technologists, x-ray technicians, and the medical record librarian. With the diagnosis made, the drugs of the pharmacist, the nourishing food of the dietitian, the restorative work of the physical therapist, and the care of the nurse help to bring Julie back to health. This is a moving story which is well told and has a powerful emotional appeal. The complexity of the modern hospital service, including the record room, visiting medical staff, internist, surgeon, pathologist, radiologist, interns and residents, medical technologists, x-ray technicians, pharmacist, dietitian, physical therapist, and nurse, is shown in the right perspective. It will appeal to high school and college students and is especially recommended for physicians who are called on to lecture to groups on health careers.

Ectopia Cordis in a Twin: 16 mm., color, sound, showing time 8 minutes. Prepared in 1957 by Elliott S. Hurwitt, M.D., and Alvin Lebendiger, M.D., New York. Produced by a grant in aid from Medical Research Division of Johnson and Johnson. Procurable on loan (service charge $1.00) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

Complete ectopia cordis in a live infant occurs so infrequently that few physicians are given the opportunity to observe a newborn baby whose heart is beating outside of the thoracic cage. The authors have prepared this film to document a situation that has rarely been reported: premature twin boys, one essentially normal and the other born with his heart projecting almost at a right angle to the long axis of the body. The surgical attempt to provide a covering of skin for this heart, the postoperative appearance of the baby with his heart beating subcutaneously, and the combination of major intracardiac and extracardiac abnormalities found at autopsy are illustrated and demonstrated. This case-record film presents an unusual condition. An attempt made to replace the heart in the chest proved unsuccessful. Nevertheless, the condition, although unusual, is of interest, especially to cardiologists.

Someone Is Watching: 16 mm., black and white, sound, showing time 15 minutes. Produced in 1957 by Information Productions, Inc., New York, for the New York State Department of Health. Procurable on loan (service charge $2) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

This motion picture calls attention to the various ways in which legal narcotics stocks fall into the hands of dope addicts and peddlers through carelessness and false confidence, and it emphasizes the need for safeguarding of drugs. Actual cases are taken from the files of the New York State Health Department's Bureau of Narcotics Control. Included among these cases are those of a registered nurse who gains a place on the hospital staff and steals from the hospital drug stocks while on duty, a repairman who gains admittance to the office of a general practitioner under the pretense of having been called to repair a sterilizer, and a confidence man working with accomplices who dupes even the wary druggist. This film is highly recommended for showing to physicians, hospital administrators, nurses, and pharmacists.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Perforation of the Heart During Cardiac Catheterization and Selective Angiocardiography. D. J. W. Escher, J. H. Shapiro, B. M. Rubinstein and others. Circulation 18:418-422 (Sept.) 1958 [New York].

The authors report on a 24-year-old woman who was admitted to Montefiore Hospital in New York for evaluation of suspected congenital heart disease. The patient underwent a standard diagnostic cardiac catheterization with the aid of a Cournand type catheter, and after its completion selective intracardiac biplane angiocardiography was performed with the aid of a 7 National Institutes of Health (NIH) catheter. Anteroposterior and left lateral projections were obtained 2 and 8 seconds after the injection of the contrast medium (50 cc. of 70% sodium acetrizoate [Urokon]) into the right ventricle; they revealed the appearance of some of the contrast medium in the pericardial cavity coincident with its anticipated appearance within the right ventricle. The amount of contrast medium in the pericardial cavity was gradually increasing to the end of the examination. Several globules of the contrast medium were seen in the right ventricular apical myocardium distal to the tip of the cardiac catheter, suggesting that perforation of the heart had occurred at this point. A portable chest roentgenogram, with the patient in the sitting position, showed the cardiac shadow to be somewhat enlarged, with contrast medium collected along the diaphragmatic surface of the pericardial cavity. The heart rate rose to 139, the blood pressure dropped to 70/40 mm. Hg, and the occurrence of cardiac tamponade seemed certain.

With the aid of general endotracheal anesthesia, the right chest was opened and the heart exposed. A vertical pericardial incision was made anterior to the right phrenic nerve, and about 200 cc. of blood-stained fluid gushed forth under tremendous pressure. The heart beat immediately became strong and full, and the peripheral pulses returned. At the apex of the right ventricle, there was a soft cleft, the point where the perforation must have occurred. There was no further bleeding. The postoperative course was uneventful. There is reason to suspect that perforation probably did not occur with the Cournand catheter which is relatively flexible and which was not inserted in the area of the apex of the right ventricle. The perforation occurred more likely during the insertion of the relatively sharp-tipped, more rigid NIH catheter, most probably when the catheter was additionally advanced after its initial positioning. The occurrence of perforation of the myocardium during cardiac catheterization with selective angiocardiography serves to emphasize some of the risks taken in the application of several of the newer, specialized methods now available for the evaluation of congenital heart disease. With careful technique and good team work, however, the danger to the patient can be held to a minimal level and is far outweighed by the positive values of the procedures.

A Study of the Manifestations of Rheumatic Fever Following Cessation of Therapy. E. E. Fischel, C. W. Frank and M. T. Bellows. Circulation 18: 367-370 (Sept.) 1958 [New York].

The authors studied the reappearance of rheumatic activity in 257 children during a 3-week observational period after cessation of treatment for acute rheumatic fever with corticotropin (ACTH), cortisone, and aspirin administered for 6 weeks in a cooperative clinical trial of these drugs in the United States and Canada. Of the 257 children, 67 (26.1%) did not show any manifestations of rheumatic activity, and the remaining 190 (73.9%) had some manifestations, most frequently an increased erythrocyte sedimentation rate or rise in temperature. Occasionally more severe and complex manifestations occurred. The number of manifestations was greater in those patients with more severe initial involvement, i. e., at the start of the 6-week therapy. In some patients the severity of the disease during the post-therapy period was as great or greater than at the institution of the treatment. In most instances, the various abnormalities subsided spontaneously. Re-treatment was considered necessary for only 6 patients.

When any or all of the presenting manifestations of rheumatic fever subside during drug therapy, the effect may be attributed to several possible causes: spontaneous remission in the course of the

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

disease, bed rest, or the drug administered. After cessation of therapy, the recurrence of rheumatic manifestations is ample evidence that the drug employed did not eradicate the disease. However, it is also evidence, in retrospect, that the drug had a suppressive action while it was being administered. It was widely thought that aspirin did not affect the rheumatic inflammation in the heart, and that concept has occasionally been extended to cortisone. The recurrence of heart failure or pericarditis after withdrawal of either drug conflicts with this view. A flare-up of the disease process could not be expected if a totally ineffective agent were withdrawn. The manifestations of the post-therapy period are sufficiently common under apparently good conditions of management. Study of the post-therapy period should be included in attempts to define optimal therapy for rheumatic fever, and it may provide some perspective concerning diagnostic criteria.

The Cardiac Complications of Hypertension. A. L. Cornish. J. Kentucky M. A. 56:862-864 (Sept.) 1958 [Louisville, Ky.].

At least 60 to 75% of hypertensive patients ultimately succumb to cardiac complications, especially heart failure. Coronary atherosclerosis has been found in 90% of patients dying with hypertension. Cardiac involvement, as a rule, does not develop until hypertension has been present for 12 to 15 years. Eventually the strain of maintaining an elevated blood pressure, plus the effect of coronary sclerosis, takes its toll on the ventricular muscle. In all probability, the effect of coronary sclerosis predominates. Later, impairment of kidney function leads to retention of salt and thus aggravates congestive heart failure. The hypertensive heart patient may present himself with either congestive heart failure or the picture of coronary insufficiency or both. Congestive heart failure develops slowly in about half of the patients and suddenly in the other half. When it is sudden, a definite precipitating cause should be searched for. Correcting the precipitating cause greatly improves the prognosis. The more common precipitating causes of acute congestive heart failure in hypertensive patients are respiratory infections, increased coronary insufficiency (silent infarction), paroxysmal tachycardia, excessive sodium intake, discontinuation of digitalis therapy, hemorrhage and anemia, development of thyrotoxicosis, pulmonary embolism, too rapid administration of blood or other sodium-containing infusions, physical and emotional strains, and uncongenial climatic conditions.

In the further management of hypertensive patients with congestive failure, the author found it useful to let the degree of functional impairment guide the treatment. In a class 1 patient, when heart disease is present but there is no symptomatic limitation of activities, he merely tries to lower the blood pressure, explains the precipitating causes of heart failure, and encourages weight reduction. If the patient is in class 2 and has symptoms on moderate exertion, periods of rest plus a slowing down and delegation of responsibility are advised. In a class 3 patient, who has symptoms on ordinary exertion, the author uses more active measures, such as careful digitalization and moderate sodium restriction. Another important manifestation of hypertensive heart disease is angina pectoris. The essential clinical feature is that the anginal pain occurs with exertion and excitement, lasts only a few minutes, and is relieved by rest and administration of glyceryl trinitrate (nitroglycerin). The electrocardiogram is diagnostic in 95% of cases, showing depression of the RS-T segment and T-wave abnormalities. If these are not present when the patient is at rest, Master's exercise test may bring them out. Factors contributing to angina pectoris must be searched for and treated—for example, anemia, hyperthyroidism, peptic ulcer, diaphragmatic hernia, gallbladder disease, and associated heart failure. Precipitating factors must be avoided. Slow walking, with rest periods, and care about exercising on a full stomach and in cold weather are advised. Nearly every obese patient benefits from losing weight. Of all drugs used for angina, glyceryl trinitrate alone has stood the test of time. A mild sedative may help the anxious patient.

Degenerative Cardiovascular Disease in the Orient: II. Hypertension. H. A. Schroeder. J. Chron. Dis. 8:312-333 (Sept.) 1958 [St. Louis].

The author studied the incidence of arterial hypertension and its serious consequences among the patients of 13 university teaching hospitals in 9 Oriental cities, namely, Taipeh (Taiwan or Formosa), Victoria (Hong Kong), Manila (Philippine Islands), Bangkok (Thailand), Agra, Lucknow, Bombay, and New Delhi (India), and Beirut (Lebanon), and in Japan. Hypertension was frequently observed among these Oriental populations, being diagnosed both clinically and pathologically. In several cities cardiologists or internists expressed the opinion that the incidence of hypertension was increasing. No conjecture can be made as to whether the apparent increase in hypertension is merely one symptom of an aging population or is related to some new environmental factor added during the past 27 years covered by the study. When measured in Oriental people, dietary intakes of sodium chloride, to which hypertension might be related, either approximated or were less than the ranges commonly accepted for Americans, with the possible exception of the northern Japanese. Therefore, it was most difficult to ascribe the frequency of hypertension to such dietary habits. Nor was it possible to involve the intake of protein, which, in general, was lower than that of Western populations and in many cities consisted largely of vegetable proteins. "Westernization," i. e., the adoption of European culture, habits, and food, was little apparent, except among a few of the well-to-do, for income levels are very low in all these countries. The author believes that environmental factors, so far unrevealed, played the leading causative role.

One of the most interesting and unexplained results of this study is the predilection of hypertension to make its consequences obvious either on the vessels of the brain or on the heart in different localities. Thus, cerebral hemorrhage as the fatal outcome has far outdistanced heart failure in Taipeh, Bangkok, and Agra, while cardiac disease is as predominant in Manila, Beirut, Bombay, and Lucknow as it is in the United States. Civilian Chinese in Formosa and Hong Kong are more apt to die of apoplexy than heart failure. Thus, it appears that cerebral hemorrhage is a much more common outcome of hypertension among peoples of the yellow and brown races than among Indo-Europeans or Semites in the cities visited. There was no obvious relationship of the amount or kind of dietary fat or salt to these consequences of hypertension. This study serves to dispel unproved rumors that hypertension does not occur in some Oriental countries.

Cardiovascular Disease in Arachnodactyly. F. S. P. Van Buchem. Acta med. scandinav. **161**:197-205 (No. 3) 1958 (In English) [Stockholm].

The diagnosis of arachnodactyly is important because this condition is not infrequently combined with abnormalities of the eyes and especially of the heart, aorta, and pulmonary artery. The patients are usually tall and of asthenic body build. Because the extremities are very long, they have an arm span that exceeds body height. They have strikingly long and thin fingers and toes, a muscular system that is usually hypotonic and insufficiently developed, a slight layer of subcutaneous fat, and flaccid articular ligaments permitting abnormal joint movements. The patients suffer from kyphosis, kyphoscoliosis, flatfeet, genu valgum, and sometimes a funnel chest or pectus carinatum. The head is dolichocephalic, the face is long and narrow, the palate has a high arch, and the teeth are often irregular. The characteristic longitudinal growth of these patients starts at an early age, and not infrequently in younger patients it is so marked that the final height is abnormal. Moreover, in younger patients the bone age may be 3 or 4 years higher than the chronological age. The cardiovascular abnormalities which the author observed in patients in this category included aneurysms of the ascending aorta, thoracic descending aorta, abdominal aorta, and pulmonary artery, aortic coarctation, pulmonary stenosis, left-sided vena cava superior, ventricular septal defect, and "arachnodactyly heart."

Pulseless Disease. R. di Bello, O. Etorena and R. Rodríguez Barrios. An. Fac. med. Montevideo 43:37-42 (Jan.-April) 1958 (In Spanish) [Montevideo, Uruguay].

A woman with subjective and objective symptoms of circulatory disorder due to occlusion of the main branches arising from the aortic arch was observed at the age of 23 years and again at 37. At the first consultation the patient complained of pain in the arms, of occasional precordial pain which radiated to the back, and of transient hemiparesis. The pulse arising from the aortic arch was absent. Arterial pulsation in the legs was present in all the areas of usual palpation for its detection. The reaction for syphilis was negative. A diagnosis of syndrome of the aortic arch was made. The patient had antisyphilitic treatment for 1½ years, after which she said she felt better and did not report for consultation for 12 years. On the second consultation all the early symptoms presented a slow course, with periods of improvement and relapse. New symptoms consisted of occasional transient loss of memory and loss of vision, irritability, and bilateral facial pain during mastication. The erythrocyte sedimentation rate was increased on both the first and the second examination. On auscultation, there was a thrill over the left supraclavicular fossa after the systole. The patient did not have syphilis or diabetes. Examination of the fundus of the eyes showed the characteristic presence of venous microaneurysms. A diagnosis of pulseless disease from occlusion of the main branches of the aortic arch was made because of the negative results of tests for syphilis, the lack of thrombi, the increased velocity in the sedimentation of the erythrocytes, and the sex and age of the patient. A treatment with corticosteroids was given the patient for more than a year, up to the present time, with marked improvement in the symptoms. The authors direct attention to the value of corticosteroids as symptomatic treatment of pulseless disease.

Spontaneous Pneumothorax in Asian Influenza. R. I. H. Welsh. South African M. J. 33:817-818 (Aug. 16) 1958 [Cape Town].

During the epidemic of Asian influenza, which was at its height in the Transvaal Province of the Union of South Africa during July and August, 1957, about 200 nurses with this form of influenza were admitted to the General Hospital in Pretoria. In 2 of these nurses spontaneous pneumothorax developed, and both of them died. The author believes that in this condition air finds its way into the perivascular tissue planes of the lung via ruptured alveoli, bronchioles, or a bronchus and spreads toward the mediastinum. Its path may then follow the fascial plane of the great vessels into the neck and present clinically as surgical emphysema. A build-up of pressure in the mediastinum may result in a rupture of the pleural covering, with the development of pneumothorax. It is likely that this was the sequence of events in the first patient. Air rarely leaks into the interstitial pulmonary tissues without predisposing causes. In this instance atelectasis of the right lower lobe, with overinflation of adjoining areas, bronchospasm, and cough, was sufficient to predispose the lung to this condition. A pneumatocele bursting into the interstitial lung tissue would have been a ready explanation for the sequence of events.

The spontaneous pneumothorax in the second patient was the result of rupture of a pneumatocele into the left pleural cavity. Pneumatoceles forming in areas of consolidation and resultant spontaneous pneumothorax from their rupture are characteristic roentgenologic findings in staphylococcic pneumonia. Staphylococcic pneumonia seems to occur most commonly as a complication of influenza. In the 1957 epidemic of Asian influenza Staphylococcus pyogenes var. aureus was the most dangerous secondary invader. The sputum culture of coagulase-positive staphylococcic and characteristic roentgenologic signs of pneumatoceles in this patient confirmed the diagnosis of a secondary invasion. That the improvement after release of the tension within the pleural cavity was only temporary indicates the overwhelming nature of the combined infection.

Plasma-Clearing Effect of Gastric Mucin in Healthy and Atherosclerotic Subjects Under Basal Conditions. B. Rossi and V. Rulli. Circulation 18:397-399 (Sept.) 1958 [New York].

The authors determined photometrically the optical density of the plasma obtained from 5 apparently healthy persons and from 10 patients, presumed to have atherosclerosis because of a history of myocardial infarction or of definite anginal symptoms with clear-cut electrocardiographic changes, who had been fasting for at least 12 hours. The determinations were made immediately and again after 20 hours at room temperature. Although the optical density of the plasma varied in the different persons and at different times, it remained unchanged during the 20-hour observation period. The densitometric curve was higher among the atherosclerotic patients than among the healthy persons. The determinations of the optical density of the plasma were repeated a few days later on the same persons who this time were given 250 mg. of gastric mucin before the determinations were made. Administration of gastric mucin was always followed by a reduction in the optical density of the plasma. In both groups the maximal reduction occurred at the end of the third hour. The magnitude of the clearing effect at this time was 30% for the healthy persons and 26% for the patients with atherosclerosis. The clearing effect was similar to that of heparin in regard to constancy and degree, but differed insofar as it lasted longer and did not increase with the passage of time in vitro at room temperature. The mechanism underlying the clearing effect of gastric mucin is not clear, but it seems likely that it is not due to an enzymatic effect of the lipoprotein lipase type, such as the one that is apparently responsible for the heparin clearing effect.

Studies in Cystic Fibrosis of the Pancreas: Occurrence of Rectal Prolapse. L. L. Kulczycki and H. Shwachman. New England J. Med. 259:409-412 (Aug. 28) 1958 [Boston].

This survey comprises 386 patients with cystic fibrosis of the pancreas, 85 (22.6%) of whom gave a history of rectal prolapse. There were no significant differences regarding the sex of the patients. The initial prolapse occurred most commonly between 1 and 2 years of age; in 67 patients (78.6%) the prolapse occurred before a diagnosis of cystic fibrosis of the pancreas was made. Eight patients had prolapse on 1 occasion, and 46 had prolapse on more than 10 occasions. In 46 patients (54.1%) the duration of the complaint was less than 1 year, although in some cases it recurred over a period of more than 5 years. Analysis of the data revealed that many more cases were diagnosed early in life in the larger group in whom rectal prolapse never developed. In most instances rectal prolapse was partial with a descent of the mucosa alone, manual replacement usually being accomplished readily. In 16 patients rectal prolapse was the principal complaint for which parents sought medical advice, and in 2 other patients the attending physician recognized the rectal prolapse as one manifestation of a general nutritional or metabolic problem. In 14 patients the problem was considered a local one until more striking manifestations of cystic fibrosis of the pancreas developed.

In retrospect, a more carefully taken history and physical examination, combined with the performance of a few simple laboratory tests, such as the stool trypsin and chloride imprint tests and roentgenogram of the chest, might have given a clue to the pathological process. Mention is made of the long interval between the initial complaint of rectal prolapse and the diagnosis of cystic fibrosis of the pancreas. In 7 patients the diagnosis of cystic fibrosis was made between 3 and 10 years after the initial episode of rectal prolapse; in 4 cases the interval was 1 to 3 years, and in 5 cases it was less than 6 months. In only 4 patients was the nutritional status of the patient considered good. Only 2 patients had severe pulmonary changes; 1 was free of recognizable pulmonary involvement; and the remaining 13 had varying degrees of pulmonary changes. The institution of dietary therapy, primarily a high-protein and a reduced fat intake, combined with pancreatic replacement therapy, plus antibiotics to control the pulmonary infection, will usually suffice to correct many of the factors responsible for rectal prolapse. The earlier the diagnosis of cystic fibrosis of the pancreas, the less the likelihood of rectal prolapse.

The Blood Volume After Plasma and Blood Transfusions. E. Wollheim and K. W. Schneider. German M. Month. 3:237-240 (Aug.) 1958 (In English) [Stuttgart, Germany].

The authors studied the behavior of the "active" plasma and blood volume in healthy persons and hospitalized patients after 84 plasma transfusions, each of which varied from 450 to 460 cc., and 49 whole blood transfusions, each of which varied from 440 to 450 cc. The term "active blood and plasma volume" refers to the plasma volume, which was determined by differential photometry within 4 to 10 minutes after the injection of 10 cc. of 0.2% Evans blue (T 1824), and to the red blood cell volume calculated from the hematocrit reading. The results of these determinations were compared with those obtained by the analysis of simultaneously drawn samples for red blood cells tagged with radioactive phosphorus (P^{32}) or radioactive chromium (Cr^{51}). The plasma and whole blood determinations were made before the transfusions and at various intervals after the transfusions over a period up to 18 hours.

An increase in plasma volume was observed after 52 (62%) of the 84 plasma infusions and after 23 (47%) of the 49 whole blood transfusions. The plasma volume remained unchanged after 32 (38%) of the plasma transfusions and after 26 (53%) of the whole blood transfusions; in the absence of any increase, the plasma or blood either may have passed into the capillary network with lower circulation or may have entered the extravascular tissues already during the transfusion. An increase in plasma and blood volume occurred particularly in persons in whom plasma or blood volume had been decreased before the transfusion was given. These findings suggest a volume-regulating mechanism. An increase in volume appeared to be more likely after the transfusion of plasma than after that of whole blood.

Tetanus and Chronic Ulcers of the Legs. P. Riis. Nord. med. 60:1048-1049 (July 24) 1958 (In Danish) [Stockholm].

Between 1940 and 1958, 88 patients with non-neonatal tetanus were admitted to the epidemiologic department of the Blegdam Hospital in Copenhagen. In 10 patients, between the ages of 19 and 70 years, the infection was apparently through chronic ulcers of the legs. Nine of these ulcers were varicose, and one was due to erythema induratum. Toxigenic tetanus bacilli were found in excised ulcer tissue from 5 patients. The course of tetanus in the patients in whom the portal of entry was one or more ulcers of the leg was usually protracted, and in 2 it was fatal. In patients with chronic leg ulcers the period during which conditions for growth of Clostridium tetani are present is longer than in patients with smaller traumatic wounds. Chronic varicose ulcers seem to have become relatively more important as portals of entry for Cl. tetani in recent years, as tetanus infections from purely traumatic lesions have been reduced through widespread prophylaxis. Patients with chronic ulcers of the leg should be immunized against tetanus; the vaccination entails no risk.

The Carpal Tunnel Syndrome. J. B. Lyons. Irish J. M. Sc. 6:382-388 (Aug.) 1958 [Dublin].

When fully developed, the carpal tunnel syndrome is characterized by pain and tingling in the hand in the distribution of the median nerve, impaired appreciation of light touch, pin-prick, and tactile discrimination in the fingers over the median territory, weakness of the abductor pollicis brevis and opponens pollicis, and wasting of these muscles causing a distinctive, shelf-like, partial thenar atrophy. Impairment of fine movements, e. g., picking up small objects between thumb and fingers, is invariable. The condition is frequently bilateral. Incidence is highest in the 5th and 6th decades and is commoner in women. The syndrome may occur spontaneously but has been described in a variety of conditions which cause encroachment on the carpal tunnel. The author tabulates the salient points in the clinical pictures of 11 patients with the carpal tunnel syndrome. All the patients were in the 4th decade or older, and all but 3 were women. Pain and/or paresthesia were the main symptoms.

The author discussed the relationship of the carpal tunnel syndrome to acroparesthesia, pointing out that this term has been used to designate a clinical picture most commonly seen in middle-aged women of the working class affected by an unpleasant and distressing tingling involving one or both hands. Acroparesthesia is usually most troublesome at night, preventing sleep or waking the patient and causing her to hang the limb over the side of the bed or to get up and pace the floor seeking relief; in the morning the fingers feel clumsy and swollen. The etiology of this condition has been ascribed variously to cervical osteoarthritis, cervical rib, and the thoracic inlet syndrome. On a suggestion that acroparesthesia is caused by median nerve compression at the wrist, a number of patients have been treated successfully by division of the transverse carpal ligament. In support of the contention that the lesion responsible is situated at the wrist, it was pointed out that frequently the 5th finger is unaffected, that careful sensory testing will reveal loss of median distribution, and that a varying degree of partial atrophy may be present. The essence of a test that is sometimes helpful is that obliteration of the blood supply to the forearm by a sphygmomanometer cuff may cause in some cases of median nerve compression a rapid onset of distressing tingling and pain, most marked in the thumb, index, and possibly ring fingers, or the development of sensory loss in the median territory. Splinting of the wrist may have diagnostic as well as therapeutic value.

Ulcerative Colitis. E. S. R. Hughes. M. J. Australia 2:181-185 (Aug. 9) 1958 [Sydney].

The author has reported on 58 men and 70 women with ulcerative colitis who have been observed in Melbourne since 1950. Most of the 128 patients were between the ages of 20 and 50 years. Ulcerative colitis was mild in 61 patients, of severe chronic type in 55, and of severe acute or fulminating type in 12.

As to the first group, the inflammation was mild in patients with proctitis, and it appeared likewise to be mild in the zone of transition between the normal and the inflamed mucosa in patients with the more severe form of proctocolitis. In 43 of the 61 patients with mild manifestations, the inflammation was limited to the rectum or to the rectum and rectosigmoid section, and in 18 patients the more proximal part of the colon was involved. The external appearance of the intestine was normal, and the lumen was readily distensible. Radiologically, the function appeared normal. Reassurance that cancer was not the cause of symptoms was sufficient treatment for a large number of patients with this type of ulcerative colitis. Increased hours of sleep, a low-residue diet, and the occasional insertion of bland suppositories proved useful in a number of the more resistant patients. Antibiotics did not exert any permanent effect on the disease. Psychotherapy appeared to be a useless method of treatment. No patient in the group with mild manifestations has advanced to a stage where surgery has been considered.

In the 25 men and 30 women of the second group with severe chronic manifestations, nonsurgical treatment of ulcerative colitis did not produce more than temporary relief. Longer hours of rest, a nonresidue diet, and transfusions of whole blood accomplished more than prolonged antibiotic therapy did. Steroid therapy was not used in any extensive trial. It is generally accepted that for patients with this type of the disease surgical treatment is the best method, but 9 of the 55 patients have not yet given their consent for such treatment, and only 2 have made arrangements to undergo surgery later. Four patients in this group died of carcinoma. The remaining 39 patients were subjected to surgical treatment. Pathological examination of the surgical specimens obtained from 35 of these patients who underwent colectomy revealed inflammatory changes. These changes were confined to the descending colon in 4 patients. There was involvement of the whole colon except the cecum and ascending colon in 6 patients, involvement of the whole colon but not the ileum in 7, and involvement of the ileum in 18. Diarrhea had been present for years, associated with anemia, loss of weight, and chronic fatigue. Exacerbations and remissions were characteristic of this group. In 8 of the 128 patients malignant growth was superimposed on the colitis. Seven of these 8 patients with carcinoma of the colon belonged to a group of 19 with a history of colitis for 10 or more years; the 8th patient had had a history of colitis of 7 years' duration. These data show that malignancy may supervene in patients with ulcerative colitis of long duration.

In the third group of 6 men and 6 women with severe acute ulcerative colitis, sigmoidoscopy revealed ulceration of the mucous membrane. The intervening bridges were pale and edematous or red and friable. The chief diagnostic difficulty lay in deciding whether or not peritonitis or peritoneal abscess was present. As a rule, laparotomy was necessary. In each patient turbid fluid was present in the peritoneal cavity, but in only one was there free gas. This latter patient, aged 62 years, had been treated with cortisone without success. Ten of these 12 patients were subjected to surgical treatment, and on each the operation was performed as an emergency procedure. Ileostomy and subtotal colectomy were performed on 5 patients; 1 patient died. On the remaining 5 patients ileostomy and proctocolectomy were performed; again 1 patient died. Two patients did not submit to operation, and both died.

Surgery of ulcerative colitis has improved during the past few years. The colon can be removed in a single stage. Ileostomy and the prevention of complications related to this construction are better understood; the appliances used in ileostomy have been simplified. The mortality associated with ulcerative colitis may be reduced by early operation in acute fulminating cases and by urging more patients partially disabled by chronic ulcerative colitis to undergo surgery.

Cushing's Syndrome in Childhood: Report of Case of Adrenocortical Carcinoma with Excessive Aldosterone Production. W. P. U. Jackson, B. Zilberg, B. Lewis and D. McKenzie. Brit. M. J. 2:130-133 (July 19) 1958 [London].

Adrenocortical overactivity in childhood may produce 2 distinct syndromes. The adrenogenital syndrome caused by excessive production of androgens manifests itself in 3 ways: pseudohermaphroditism and virilism in a female and a "pocket Hercules" variety of isosexual precocity in a male. An excess of glucocorticoids results in Cushing's syndrome without masculinization. The authors report a characteristic "mixed picture" of a Cushing syndrome and an adrenogenital syndrome in a 2½-year-old girl. Since the age of one year there had been a rapid gain in weight, and at this age pubic and axillary hair appeared. Physical examination revealed an obese child with Cushing-like facies and signs of virilism. The patient had a plethoric appearance, a strong body odor, an enlarged clitoris, and a well-marked "buffalo neck," although there was no true breast development. Roentgenograms of the long bones showed normal bone age and the absence of osteoporosis, and pyelograms revealed normal functioning kidneys, with the exception that the left kidney was depressed and a mass was visibly present above it. The 24-hour urinary output of 17-ketosteroids was 39 mg., of 17-ketogenic steroids 11.6 mg., and of aldosterone 75 mcg., the normals of which are less than 2 mg., 3 mg., and 10 mcg. respectively. The patient received 50 mg. of cortisone and was later subjected to a left-sided adrenalectomy. The blood pressure dropped from the initial 140/90 to 100/70 mm. Hg. Five to 12 weeks after the operation the patient had lost a total of 7 lb.; she was no longer plethoric; the facial eruption had diminished; the "buffalo hump" on the neck had disappeared, as had the body odor; and the clitoris was smaller. Hirsuties was still present, although the urinary output of 17-ketosteroids had fallen to 1 mg. per 24 hours. Seven months after the operation the clitoris was of normal size, and the pubic hair had disappeared.

Cone Shell Stings: Recent Cases of Human Injury Due to Venomous Marine Snails of the Genus Conus. A. J. Kohn. Hawaii M. J. 17:528-532 (July-Aug.) 1958 [Honolulu].

The author discusses 8 hitherto unreported cases of injury sustained by man and due to stings of marine mollusks of the genus Conus. Five of these occurred in the Hawaiian Islands, and the persons affected were stung by the mollusks while collecting cone shells. The 6th case occurred in the Marshall Islands, and the 7th in the Mariana Islands. No cases of Conus stings have previously been reported from these 3 archipelagoes. The 8th case occurred at Hope Island, Australia. Five of these 8 cases were caused by 4 species of Conus not previously known to be toxic to man, namely, Conus lividus, C. pulicarius, C. obscurus, and C. nanus. All species of Conus are potentially dangerous to man, but certain species are particularly venomous The latter are often characterized by relatively thin univalve shells with wide apertures, which may flare basally. The size of the cone shells varies from 3 to 23 cm., (1 to 9 in.). It seems probable that the larger the size the larger the quantity of venom delivered. Some large species, however, have a rather poorly developed venom apparatus and are likely to be of little danger to man despite their size. According to Hinegardner of the department of zoology of the University of Hawaii, the venom apparatus of the cone shell consists of the following parts: a muscular bulb, which is attacked to a long, convoluted venom duct, in which the venom is secreted; a radula sheath, in which the radula teeth are produced and stored; a muscular pharynx; and an extensible proboscis. A salivary gland is attached to the radula sheath. Prior to the actual sting, the radula tooth is forcefully inserted, by the proboscis, into the mollusk's victim. Then the venom is injected through the hollow tooth, which is held at its base by the end of the proboscis. How the venom is forced through the tooth is not clear. The living animals should be handled, if necessary, with special care.

Seventeen cases of Conus stings had been reported previously by other workers, and 1 additional case, which occurred in the Seychelles Islands, has come to the attention of the author since he submitted his paper for publication. Thus, a total of 26 cases of Conus stings are now known. Of these, 5 due to C. geographus and C. textile were fatal, but none of them occurred in the Hawaiian Islands. The symptoms resulting from Conus stings vary considerably. Localized ischemia cyanosis, and numbness in the area about the wound or a sharp stinging or burning sensation are usually the initial symptoms. In severe cases paralysis of the voluntary muscles begins early. Knee jerks are generally absent. Aphonia and dysphagia occasionally become very marked. Blurring of vision and diplopia are commonly present. Nausea may be present. Coma, cardiac failure, and respiratory distress have been reported by other workers. Immediate lancing of the wound and sucking of the venom from it are recommended. Further treatment is symptomatic.

Chest Pain of Colon Origin. E. D. Palmer. Gastroenterologia 90:15-21 (No. 1) 1958 (In English) [Basel, Switzerland].

The author, who is connected with an American hospital in Germany, observed in the course of a year 30 patients with the primary complaint of chest pain and with a colon gas syndrome as the explanation. The gaseous distention involved the hepatic or splenic flexures of the colon, usually the latter. Almost always colon symptoms per se were wholly absent, as were other abdominal symptoms, and the colonic basis for the problem was not apparent to the patient or often at first to the physician. In 26 of the 30 patients the gas syndrome was the whole problem, and in the remaining 4 the gas syndrome prolonged and superimposed atypicalness on the chest pain of acute myocardial infarction (Laubry-Soule syndrome). The 4 patients with Laubry-Soule syndrome were patients who, within

3 or 4 days of acute myocardial infarction, experienced new pain and a distressing feeling of fulness in the anterior part of the chest on the left, had difficulty in taking a deep breath without true dyspnea, and had a tremendous collection of gas in the splenic flexure with elevation of the left leaf of the diaphragm, all in the absence of any sign of extension of infarction or of cardiac decompensation. These patients had no difficulty in distinguishing this new pain from that of the infarction.

The 30 patients included 16 women and 14 men, ranging in age from 22 to 54 years. The duration of painful symptoms prior to study varied from less than a day to several years. Three patients presented themselves as emergency problems of acute new chest pain, but most had had recurrent pain for a few weeks to several months, with varying intensity from time to time. All the patients complained of pain which was predominantly paroxysmal, the paroxysms being sudden in onset, lasting from a minute to a couple of hours, and subsiding rather rapidly, either completely or leaving persistent heavy discomfort in their wake. In the outpatient clinic of the American-German hospital, chest pain of colon origin was about 3 times as common as duodenal ulcer. This symptom complex seems to be more of a problem in this overseas region than back home. In a fair portion of patients the onset of symptoms coincided with their overseas movement. Patients often suggested that change in food and water might be responsible. Treatment with buttermilk was remarkably effective in some cases, rather ineffective in others.

Phaeochromocytoma, Diabetes and Glycosuria. P. Freedman, R. Moulton, M. L. Rosenheim and others. Quart. J. Med. 27:307-321 (July) 1958 [London].

The authors report on a 37-year-old man and on 3 women, between the ages of 32 and 65 years, with pheochromocytoma which caused severe diabetes mellitus in 2 of these 4 patients and persistent glycosuria in the other 2. A diagnosis of diabetes mellitus had been made in 3 of these patients before the adrenal tumor was discovered, and many of their symptoms had been considered by other physicians, who did not have experience with pheochromocytoma, to be manifestations of anxiety. Severe hypertension is rare in idiopathic diabetes mellitus but is common in diabetes associated with pheochromocytoma. Advanced hypertensive retinopathy, as distinct from diabetic retinopathy, does not often occur in idiopathic diabetes mellitus but is common in patients with pheochromocytoma. In any diabetic patient with severe hypertensive retinopathy as distinct from diabetic retinopathy, the pressor amine content of the urine should be measured. The hypertension in diabetes caused by pheochromocytoma may be paroxysmal or sustained, and the blood pressure is frequently raised between attacks, as was observed in 2 of the 4 patients. Similarly, the disturbance in carbohydrate metabolism may be accentuated in paroxysms, but usually, if it is severe enough for the patient to have diabetic symptoms, glycosuria and high blood sugar levels are constantly present, as they were in these 2 patients. A high blood sugar level during attacks, sometimes followed by glycosuria, is common in patients with pheochromocytoma, and such patients may have a diminished glucose tolerance—though they have not been considered as diabetics, as was the case in the 4th patient. Surgical removal of the tumor led to considerable improvement of diabetic symptoms in all 4 patients, but the glucose tolerance test still showed considerable intolerance of carbohydrates in 2 patients, while it reverted rapidly to normal in 1. A systematic search for similar cases (including determination of the excretion of pressor amines in the urine) was made by the authors among 1,100 patients with diabetes mellitus attending the diabetic clinic of the University College Hospital in London, and 2 additional possible cases were found.

The mechanism by which pheochromocytoma may cause diabetes is uncertain. It is considered that the high plasma concentration of epinephrine, and to a much smaller extent of arterenol, causes a rise in blood sugar by accelerating glycogenolysis in the liver. This may well increase the rate of secretion of insulin by the pancreas and occasionally produce a temporary or permanent exhaustion of the islets of Langerhans. It is also possible that epinephrine may antagonize insulin by its action on the anterior pituitary gland, causing an increased secretion of corticotropin and thus indirectly stimulating the secretion of hydrocortisone. Insulin sensitivity tests carried out in one patient with diabetes caused by pheochromocytoma showed insulin resistance, thus affording indirect evidence of an increase in insulin antagonists. The insulin requirements are usually greatly decreased within 24 hours after removal of the tumor, and the patients may be completely cured of their diabetes. Pheochromocytoma should be suspected in any diabetic patient with severe hypertension and in any hypertensive diabetic patient with unusual symptoms.

Treatment of Strongyloidiasis: New Drugs. J. Asfora and M. A. Maranhão. Rev. brasil. med. 15:325-330 (May) 1958 (In Portuguese) [Rio de Janeiro].

The incidence of strongyloidiasis varies between 9 and 17% among the population of Brazil. The classical treatment, which consists in the intraduodenal instillation of 40 cc. of a 1% methylrosaniline chloride (gentian violet) solution, gives a recovery rate of less than 10% of the cases. Brazilian researchers recently reported good results from the intraduodenal instillation of methylrosaniline solution by the following technique: 1. An Einhorn sound is passed through the nose into the duodenum and left in place for 20 minutes. 2. A solution containing 60 Gm. of Panemax (a papain preparation) in 250 cc. of distilled water is then instilled, followed by the instillation of a vial of hyaluronidase. 3. Two or 3 minutes later 40 cc. of a 1% methylrosaniline solution is instilled. 4. The intraduodenal sound is removed 3 minutes later. Papain acts as a mucolytic substance by exposing the duodenal mucosa to the action of the methylrosaniline solution, whereas hyaluronidase favors diffusion of the solution over the mucosa.

Twenty patients with strongyloidiasis were treated by this technique at the clinic of the faculty of medicine of the University of Recife. The patients were between the ages of 20 and 40 years. Sixteen patients tolerated the treatment well, but 4 vomited. The treatment was repeated in 2 of the 4 patients who vomited. As a result of the treatment the clinical symptoms of duodenal parasitism disappeared, and examination of feces at late intervals proved the absence of nematodes of the strongyloides genus. The patients in whom good results were obtained included 3 with strongyloidiasis alone, 3 with strongyloidiasis and ascariasis, and 6 with strongyloidiasis and infection with other intestinal parasites. The authors conclude that the combination of papain, hyaluronidase, and methylrosaniline gives better results than any other treatment for the cure of duodenal strongyloidiasis and ascariasis (80%). When the treatment is repeated after a failure, the good results are 100%. Intolerance showed only in vomiting of the drugs; pain or any other unpleasant symptoms did not occur. The treatment is practical, economical, and well tolerated.

Systemic Lupus Erythematosus Simulating Acute Surgical Condition of the Abdomen. V. E. Pollak, W. J. Grove, R. M. Kark and others. New England J. Med. 259:258-266 (Aug. 7) 1958 [Boston].

The authors present observations on 14 patients in whom abdominal symptoms developed that were severe enough to suggest a surgical emergency. In all 14 patients the diagnosis of systemic lupus erythematosus was made on the basis of clinical observation and laboratory data. In all but 4 patients the diagnosis was confirmed by histological study of kidney specimens obtained either by biopsy or at autopsy. The clinical picture varied considerably from patient to patient. In 10 patients the abdominal illness was the result of vascular lesions ("lupus vasculitis") in the submucosa and subserosa of the intestine and its appendages and of vascular lesions in the retroperitoneal, peripancreatic, and periadrenal connective tissues. In some these lesions were widespread; in others they were localized. It was not surprising, therefore, to find that many different clinical diagnoses were made in these patients, such as acute appendicitis, acute cholecystitis, perforating peptic ulcer, volvulus, paralytic ileus, obstruction of the small intestine, severe gastroenteritis, parametritis, infection of the broad ligament, and infective peritonitis. All 10 patients complained of abdominal pain, which in 5 was dull and persistent and either involved the entire abdomen or was limited to the lower abdomen. The most frequent roentgenologic finding was distention of the large or the small intestine or both. A single attack of acute abdominal symptoms occurred in 5 paitents, and 2 or more attacks occurred in the other 5. The problems presented by these patients and the disease causing their illness are illustrated in case histories.

A clinical diagnosis of pancreatitis was made in 4 of the 14 patients. In the 3 who died, lesions were found post mortem in the pancreas and elsewhere in the abdomen. In one of these patients acute pancreatitis developed when the patient already was severely ill with renal failure due to lupus glomerulonephritis. The serum amylase level was elevated, suggesting that there was true necrosis of the pancreatic acini. This was confirmed at autopsy. The lesions in the pancreas did not appear to result from systemic lupus erythematosus. The large arteries of the pancreas were the seat of polyarteritis nodosa in one case. In the other, the small arteries and arterioles were occluded by platelet thrombi—typical of thrombotic thrombocytopenic purpura. In neither was there necrosis of the pancreatic acini, nor were the serum amylase levels elevated. Both patients had definite clinical and pathological evidence of systemic lupus erythematosus. The details of the clinical illness and pathological findings in one of these patients are presented.

The differential diagnosis of acute surgical condition of the abdomen due to systemic lupus erythematosus could be made with some confidence when the patient had concurrent involvement of other organs by the lupus and particularly when there was an abnormal urinary sediment and leukopenia. Even when a diagnosis of acute abdominal emergency from this cause has been made, it must be remembered that in such cases intercurrent, unrelated acute abdominal emergencies may develop. Exploratory surgery should not be undertaken lightly, for the trauma of the operation may result in a further deterioration of the patient's already serious clinical state. When this diagnosis is made, the patient should be treated vigorously with adrenal corticosteroids, and the drug should be given by the intravenous route if necessary. The authors found that the acute abdominal symptoms improved within 24 or 48 hours of the start of treatment with large doses of adrenal corticosteroids.

SURGERY

Persistent Post-traumatic Fluid Fistulas: Anatomoclinical and Therapeutic Study of 20 Cases. J. Calvet, G. Lazorthes, A. Ribet and Y. Lacomme. Presse méd. 66:1305-1307 (Aug. 2) 1958 (In French) [Paris].

Fractures of the base of the skull are often complicated by a transient escape of cerebrospinal fluid through a natural opening in the face. Persistence of such a flow for more than a week, however, is rare and indicates the existence of an osteomeningeal fistula. Conservative treatment, which consists in keeping the patient as quiet as possible in a recumbent or semirecumbent position, in reducing the fluid intake, and in giving antibiotics (especially penicillin), both systemically and in aerosol form, sometimes results in a definitive cure of the fistula but does not always eliminate the danger of meningitis or cerebral abscess.

Spontaneous cures usually take place within the first 10 days after the injury but may occur later, especially when the fluid escapes through the ear. Conservative treatment, however, should not be continued for more than about 3 weeks because of the serious nature of the infectious complications to which patients with osteomeningeal fistulas are always subject. Meningitis may appear long after an apparent cure of the fistula (22 months in one of the authors' 20 patients) and is no less severe then than when it develops promptly. Immediate surgical treatment is indicated only in patients with an open fracture of the frontal sinus, but conservative treatment may have to be abandoned in favor of early operation if meningitis develops or if the flow is so abundant that there is a danger of cerebral collapse.

A unilateral frontal flap usually provides adequate access to the lesion. Closure of the osteomeningeal opening can be secured in most cases by packing with fragments of muscle: one is applied to the internal aspect of the dura mater, and another, coated with sulfonamide powder and penicillin, is used to fill the opening in the bone. This method of closure, which has been used exclusively during the last 5 years, has apparently produced better results than those obtained earlier when other methods and materials were tried.

Surgery for Congenital Coronary Artery Arteriovenous Fistulae. E. H. Fell, M. Weinberg Jr., A. S. Gordon and others. A. M. A. Arch. Surg. 77:331-335 (Sept.) 1958 [Chicago].

The authors report on an 18-year-old girl and 3 boys, aged 14 months, 3 years, and 9½ years, respectively, who were operated on for anomalous coronary arteries entering directly into the venous system. In the girl, a large anomalous branch of the left coronary artery communicated with the outflow tract of the right ventricle, but the condition was not associated with an aneurysm of the artery or ventricle. In the 2 older boys the right coronary artery with a diffuse aneurysm communicated directly with the right ventricle. In the 14-month-old boy the large right coronary artery emptied into an aneurysm at the apex of the right ventricle. The anomalies in these 4 patients were believed to be congenital. The histories of the 3 boys revealed cardiac murmurs heard as early as the ages of 1, 1½, and 7 months respectively. Development was normal in each patient. All the children showed cardiac enlargement, and a machinery murmur was heard at the apex or to the right of the sternum in each patient. The catheterization studies revealed a left-to-right shunt into the right ventricle. Angiocardiograms and aortograms localized the lesions and were diagnostic in the youngest and in the oldest boy in whom the condition was correctly diagnosed before the surgical intervention; in the 3-year-old boy the preoperative diagnosis was one of rupture of the sinus of Valsalva into the right ventricle. In the girl, who did not have angiocardiographic studies, the condition was believed to be a patent ductus arteriosus before the surgical intervention.

Surgical correction of the anomalies was successful in all 4 patients; the fistulas were closed and the aneurysms resected. Normal cardiac function resulted in all the patients, and no left-to-right shunt exists. These findings suggest that patients with a coronary artery arteriovenous fistula tolerate well closure of the fistula and excision of the aneurysms of the artery or ventricle or both.

A Study of the Treatment of 637 Patients with Trigeminal Neuralgia. D. Ruge, R. Brochner and L. Davis. J. Neurosurg. 15:528-536 (Sept.) 1958 [Springfield, Ill.].

The authors report on 373 female and 264 male patients, between the ages of 15 and 89 years, with trigeminal neuralgia. Fifteen patients had the onset of pain before they reached their 25th year, and 7 noted their symptoms after they were 80 years old. The right side of the face was the site of pain in 393 patients, the left side in 228, and 16 had bilateral pain. Spontaneous remissions of pain for periods of 18 months to 7 years were observed. Extradural preganglionic neurotomy by way of the middle fossa, according to Frazier's technique modified by Adson, was performed on 627 of the 637 patients. Complete sensory section was carried out in 556 patients. Partial selective root section spared the sensory innervation of the eye in 65. The motor root was preserved in 206 patients. There were 4 operative deaths, caused, respectively, by meningitis, subdural hematoma, hemorrhage, and pulmonary infarct.

Transient ipsilateral facial paresis constituted an early postoperative complication in 41 patients, requiring commonly 1 to 4 weeks for recovery. Contralateral facial paresis with prompt recovery was observed in 1 patient, transient lateral rectus muscle palsy was experienced by 5 patients, and transient parotitis occurred in 1 patient. Continuous postoperative follow-up was possible in 513 patients, 303 of whom did not have latent postoperative complications or unfavorable results. Conjunctival infection occurred in 39 patients and corneal ulceration in 19; enucleation of the injured eye was required in 6 of the latter. Postoperative paresthesias were observed in 104 patients, and miscellaneous disturbances in 40. Two patients committed suicide, each of them 8 years after the surgical intervention.

Extradural preganglionic neurotomy is the most effective surgical procedure for the treatment of *trigeminal neuralgia. Properly performed, the operation is an anatomic one which gives relief from* excruciating pain. Most patients, if properly prepared psychologically before the operation for the loss of sensation, which must be incurred for the permanent relief of pain, do not suffer from paresthesias which interfere with their lives. Corneal ulceration occurs only after direct trauma to an insensitive cornea and is not the result of a trophic loss, independent of injury. Facial weakness and herpes of the lips, which may occur immediately after the operation, are caused by excessive and unnecessary handling of the ganglion in the latter instance and by elevation of the dura mater from the floor of the middle fossa too far posteriorly in the first instance. Patients are usually confined to the hospital for 7 to 10 days.

Experiences in the Surgical Treatment of Aortic Isthmus Stenoses (Report on 120 Operated Cases). K. Kremer, H. Hilke and K. H. Willmann. Arch. klin. Chir. 288:513-525 (No. 6) 1958 (In German) [Berlin].

In an earlier report the authors discussed the clinical aspects and the surgical treatment of stenosis of the aortic isthmus, but since then the number of patients with this defect whom they subjected to surgical treatment increased to 120. On the basis of their observations they feel that the customary *classification of aortic isthmus stenosis in infantile* and adult forms merely on the basis of anatomic factors is not satisfactory, because the functional effects of the ductus arteriosus Botalli (direction of the shunt) is of decisive importance. The situational relationship of the stenosis to the ostium of the ductus arteriosus and the absence or presence of a collateral circulation have generally been regarded as the classical differentiating characteristics between the 2 forms. Thus, it is assumed that in the infantile form the lower part of the body is supplied with blood by way of the ductus arteriosus, which is excessively dilated and terminates poststenotically, whereas in the adult form the collateral circulation is well developed because of the prestenotic ostium of the ductus.

The authors observed types of aortic isthmus stenosis that were intermediate between these forms. An adult form and infantile forms, with and without collateral circulation, are presented. A 6-year-old girl was observed, who had isthmus stenosis and a maximally dilated ductus arteriosus with poststenotic ostium; there was no collateral circulation, but despite this there existed a left-to-right shunt with extreme pressure increase in the lesser circulation. The division of the ductus reduced the pulmonary hyptertension immediately, and correction of the moderate isthmus stenosis normalized the pressure in the systemic circulation.

The authors emphasize that patients with stenosis of the aortic isthmus require surgical treatment. *The only contraindications are severe impairment* of the cardiac function, subacute endocarditis or aortitis, and age over 45 years. The prognosis is unfavorable when other congenital defects are combined with the stenosis of the aortic isthmus. The aim of the operation is always the direct anastomosis according to the technique of Gross-Crafoord; however, it should not be forced at the risk of an insecure suture. Transplantations should be restricted to a minimum.

Preparatory Treatment and Operation in Bilateral Bronchiectasis. F. Spath. Arch. klin. Chir. 288:505-512 (No. 6) 1958 (In German) [Berlin].

Resection in patients with bronchiectasis has proved to be one of the most gratifying operations of the thoracic surgeon. This applies particularly to patients with unilateral bronchiectasis. Bilateral involvement has been reported in from 20 to 40% of patients, and while bilateral resections have been successfully carried out, frequently the resection of the main focus will have such a favorable effect on the less seriously involved side that a *second operation will not be necessary*. The author observed 12 patients in whom this was the case and presents the history of one of these. If the lesions are severe on both sides, bilateral resection will be necessary, but the operation should be done first on the more severely involved side.

The results of bilateral resection are favorable, provided that certain essential steps are followed in orderly sequence: (1) exact localization of the bronchiectatic lesions by a special bronchographic technique; (2) careful testing of the respiratory and circulatory function by spirometry, bronchospirometry, oximetry, and spiro-ergometry; (3) effective and prolonged local and systemic preparatory treatment, consisting in sanitization of chronic foci of suppuration, normalization of the blood and of the fluid, electrolyte, and protein economies, also psychotherapy and the administration of vitamins; (4)

proper evaluation of the indications for the operation, and meticulous surgical technique; and (5) systematic and effective after-treatment.

In the preparatory treatment, serial endoscopic suctioning off, irrigation, and instillation of pretested sulfonamides and of antibiotics proved valuable. In a 19-year-old girl with a particularly severe form of bilateral bronchiectasis, additional climatotherapy (sojourn at an elevation of 1,200 meters [3,900 ft.]) proved helpful. A double suction drainage forces the expansion of the residual lung. The application of a depot (long-acting) anesthetic to the irritated intercostal nerves near the surgical wound will facilitate painless expectoration immediately after the patient awakens. All measures that promote expectoration should be employed. Continuous observation of the patient will make possible early recognition of dangerous atelectasis in the residual lung. If atelectasis has developed, endoscopic suctioning off of the bronchial tree should be instituted at once in order to reinflate the remaining lung, because, should atelectasis persist, new ectatic processes will develop.

Tuberculosis of the Breast: Report of 25 Cases. T. T. Yeh. Chinese M. J. 77:63-69 (July) 1958 (In English) [Peking].

The author reports on 1 man and 24 women, between the ages of 17 and 45 years, with tuberculosis of the breast. The right breast was involved in 15 of the 25 patients, and the left in 11; 1 patient had bilateral involvement in successive stages. The outer-upper quadrant was the most common site of the lesion. The interval between noticing a painless lump and obvious local infiltration was usually 1 to 2 months. This fact is of practical significance in early recognition. The duration of the disease in most of the patients varied from several months to 2 years. In cases of long duration, the lesion being deep and its development insidious, the patient was not aware of it, but even in these patients a detailed history might have facilitated differential diagnosis from cancer and nonspecific mastitis. In the early stages the margin of the tubercular lesion was indistinct on palpation, and the breast was usually not enlarged. After a quiescent period the lesion gradually enlarged, and hard and soft areas occurred with irregular margins. At this time the tissues and skin surrounding the mass were infiltrated and adherent. There was mild tenderness, swelling, and reddish discoloration of the skin. Deviation of the axis of the nipple was observed in 9 patients in whom the mass was close to the areola. A huge cold abscess, with pus discharging from the nipple, was observed in 3 patients in whom the mass softened and manifested a cystic sensation. As a rule, constitutional symptoms were absent. The general condition was either good or average in 21 patients.

Tuberculosis of the breast is usually not accompanied by active tubercular lesions elsewhere in the body. The principal routes of infection are probably through the blood stream and the lymphatic system. Pregnancy, lactation, secondary infection, and trauma are important stimulating factors. Tuberculosis of the breast is a localized process, and early diagnosis and treatment can bring about complete cure. The early stage of lesions of the nodular type may be treated conservatively by employing supportive measures and by administration of antituberculous drugs before and after operation. In the series presented early excision prevented spread of the disease and resulted in satisfactory healing of the lesions in 9 patients. When the tuberculous process involves more than one-third of the breast in patients with confluent and scirrhous-type lesions, simple mastectomy combined with preoperative and postoperative administration of antituberculous drugs is the treatment of choice. Antituberculous drugs and other antibiotics may be used simultaneously for the treatment of secondary pyogenic infections. For the treatment of tuberculosis of the breast complicated by external fistulas, early simple mastectomy is advocated. According to the author 7 patients subjected to this treatment obtained satisfactory results.

Idiopathic Retroperitoneal Fibrosis: A Condition Involving the Ureters, the Aorta, and the Inferior Vena Cava. E. Hackett. Brit. J. Surg. 46:3-9 (July) 1958 [Bristol, England].

The disorder becoming known as "idiopathic retroperitoneal fibrosis" consists of a dense flattened plaque of fibrous tissue which lies immediately anterior to the bodies of the lumbar vertebrae and the fascia covering the front of the iliopsoas muscles. It can extend across the midline, surrounding the great vessels, or may be on one side only. It may be confined to the level of the kidneys, to the brim of the pelvis, or to an intermediate area. In the 14 men and 6 women, between the ages of 23 and past 60, whose cases were collected from the literature, the plaque of fibrous tissue always enveloped and progressively constricted some or all of the structures which lie in the same site—the ureters, the aorta, the inferior vena cava, and the common iliac vessels. The histological reports showed the plaque to be composed of normal fibroblasts and collagen with some foci of cells of chronic inflammatory type; it had the general nature of a scar or keloid and not that of a fibroma or fibrosarcoma.

The author reports 2 additional cases of this disorder in 2 men, aged 40 and 54 years. The younger of the 2 died, and autopsy revealed the lesion to be fully developed. In the second patient, laparotomy revealed the lesion to be in an early or abortive stage. These 2 cases bring the total of those reported to 22. Surgical treatment was carried out in all except 1 patient. Of the 21 patients operated on, successful dissection to free the ureters or kidney was carried out in 12, 3 were subjected to nephrostomy only, 2 had nephrectomies, and 4 had diagnostic laparotomies. Irradiation treatment was given to 3 patients; the doses were 600, 840, and 4842 to 6000 r. There was apparent improvement in 2 patients, but no improvement or histological change occurred in 1. So far no satisfactory cause has been proposed for the condition. The author believes that in some, and perhaps in most cases, it is produced by organization of a hematoma or of a fibrinous effusion. The treatment should be surgical.

Acute Pancreatitis and Hyperdiastasuria after Partial Gastrectomy. S. Wallensten. Acta chir. scandinav. 115:182-188 (No. 3) 1958 (In English) [Stockholm].

The author reports an analysis of the incidence of fatal acute pancreatitis and the occurrence of hyperdiastasuria after gastric resection (Billroth types I and II) in patients with peptic ulcer. In a series of 1,769 Billroth II resections there were 12 deaths caused by acute postoperative pancreatitis, while in a comparative series of 605 Billroth I resections there were no deaths attributed to acute postoperative pancreatitis. Hyperdiastasuria occurred in 18 patients (16%) after 117 Billroth II resections and in 5 patients (9%) after 55 Billroth I resections. The difference in the incidence of hyperdiastasuria after the Billroth I and II resections is not considered significant. Whether there is penetration of the ulcer into the pancreas does not seem to affect the incidence of postoperative pancreatic disturbances. Thus, operative treatment may be extended and need not be limited to palliative resection. Although the etiology of postoperative pancreatic disturbance (acute pancreatitis and hyperdiastasuria, respectively) is still relatively obscure, analysis of the data would seem to indicate that their cause is related in some way to the operative method. Duodenal and afferent loop stagnation are adjudged as being of importance in the etiology of postoperative disturbances after Billroth II gastric resections.

Studies During the Immediate Postoperative Period Following Total Body Perfusion. E. C. Matthews, L. C. Clark, F. K. Edwards and others. A. M. A. Arch. Surg. 77:313-318 (Sept.) 1958 [Chicago].

The authors carried out physiological studies during perfusion and the immediate postoperative period in 10 consecutive patients, between the ages of 1 and 15 years, who were operated on for various congenital cardiac defects. Results showed that, if patients are perfused with fully oxygenated blood of normal pH at a rate which yields venous oxygen saturation in excess of 50%, metabolic acidosis does not occur. There is no need to perfuse at alkaline pH's in anticipation of ensuing metabolic acidosis or to administer alkali during the postoperative period. In the postoperative period, a more or less constant pattern for all the patients appeared from the intermittent arterial sampling. Initial pH values were usually low, the lowest being 7.25, but they showed a steady rise, so that most were normal by 3 hours and all were within the range of normal by 6 hours. The carbon dioxide contents initially were elevated and remained so during the sampling period. The carbon dioxide pressure likewise was initially elevated but showed a tendency to fall during the sampling period. The over-all picture was one of mild respiratory acidosis.

Thus, postoperative respiratory acidosis, comparable to that reported in patients undergoing thoracotomy for procedures not involving perfusion, may occur, but it is mild and of short duration. Sudden postoperative deaths, ascribed by other workers to oxygen toxicity, did not occur in these patients, and evidence of oxygen toxicity was not observed in these or other patients who were consistently perfused at arterial oxygen tensions ranging between 500 and 550 mm. Hg. The potential hazard of producing oxygen bubbles in the patient's arterial system exists, since the solubility of oxygen in blood is decreased with increasing temperatures; it is, however, obviated if the blood in the pump-oxygenator is maintained at the temperature of the patient's blood.

Acute Necrotizing (Pseudomembranous) Enterocolitis. A. W. Kay, R. L. Richards and A. J. Watson. Brit. J. Surg. 46:45-57 (July) 1958 [Bristol, England].

The authors report on 1 woman and 15 men, between the ages of 27 and 67 years, with acute necrotizing (pseudomembranous) enterocolitis. Of the 16 patients, 14 had been subjected previously to abdominal operations, and the enterocolitis occurred in them as a postoperative complication. The operation which most frequently preceded the condition was gastrectomy. The enterocolitis was associated with heart disease in the remaining 2 patients. The outstanding clinical feature of the 16 patients was the rapid development of a state of irreversible acute peripheral circulatory failure. Diarrhea was an inconstant feature, but it was sometimes severe. Symptoms occurred within 2 to 6 days after the surgical intervention, and all the patients died within 48 hours of the onset.

Autopsy which was performed on all 16 patients revealed that necrosis of the intestinal mucosa, associated with thrombotic occlusion of the related capillaries and venules, was the most prominent pathological feature. The changes may be widespread, localized, or focal in distribution, and they may occur in any part of the small or the large intestine and occasionally in the stomach. Superficial inflammatory exudation was not a constant finding, although in many patients it did constitute a distinct pseudomembrane. Concerning the causation and pathogenesis of the disease, the authors were unable to confirm the concept that a vasomotor disturbance associated with shock may be a causal condition. Before ascribing a causative significance to antibiotics, it should be noted that necrotizing enterocolitis was recognized, particularly as a postoperative complication, for many decades before their introduction. The hypothesis that necrotizing enterocolitis is directly due to infection of the intestine by enterotoxin-producing strains of Staphylococcus pyogenes var. aureus must be regarded as unproved, and there is considerable circumstantial evidence against the acceptance of this concept. Staphylococcic enteritis and acute necrotizing enterocolitis are probably not directly related, although they may occur together. Attention should be paid to the possibility that other bacteria, such as varieties of Clostridium welchii, might be the cause of acute necrotizing enterocolitis; the possibility that the disease may be due to a virus infection should also be considered. In the postoperative cases the clinical diagnosis between acute necrotizing enterocolitis and high obstruction of the small intestine is difficult; immediate laparotomy is, therefore, advised. Treatment for shock and the administration of erythromycin and adrenal hormones have so far proved ineffective.

Internal-Mammary-Artery Ligation for Angina Pectoris: Its Failure to Produce Relief. R. G. Fish, T. F. Crymes and M. G. Lovell. New England J. Med. 259:418-420 (Aug. 28) 1958 [Boston].

The authors report on the results of bilateral internal mammary artery ligation in a group of 24 selected patients with moderate or severe angina pectoris. All the patients were males, ranging in age from 32 to 64 years. In 22 patients the diagnosis of angina pectoris was made on the basis of a classic history, with transient electrocardiographic ST-segment or T-wave changes accompanying pain, or electrocardiographically proved transmural myocardial infarction at some time in the past. The character, duration, and progression of pain, requirements of glyceryl trinitrate (nitroglycerin), exercise tolerance, and occupational history were carefully noted. Eleven patients (46%) had previous transmural myocardial infarction; 10 (42%) had angina decubitus on admission. In 20 of the 24 patients on whom internal mammary artery ligation was performed, there was an initial marked improvement in the immediate postoperative period, which lasted for approximately 10 to 60 days. This period of improvement was marked by electrocardiographic stability, an increased exercise tolerance, and a reduction in the quantity of glyceryl trinitrate required. This improvement was particularly dramatic in patients who entered the hospital with angina decubitus and who continued to have occasional episodes of rest angina up to the time of operation—an improvement which in the light of subsequent findings is difficult to explain. Two patients died during the subsequent follow-up period, one patient succumbing 3 months after operation of bronchopneumonia complicating influenza, the other death occurring 5 months after operation as a direct result of coronary artery disease. In most of the remaining patients there was definite regression, with development of recurrent angina. The condition was such that at the time of writing there were only 4 patients who in their own opinion experienced moderate improvement and 2 who believed that they were slightly improved. In the remaining 18 patients the anginal syndrome resumed its preoperative course. Whether or not the survival time of these patients has been increased by an operation that failed to alter symptoms is an interesting speculative aspect of this and other surgical attempts to revascularize the myocardium.

Citrate Intoxication: A Clinical and Experimental Study. J. Ludbrook and V. Wynn. Brit. M. J. 2:523-528 (Aug. 30) 1958 [London].

The authors report on 3 men, between the ages of 24 and 55 years, and on a 44-year-old woman who were operated on with the aid of hypothermia for the following conditions: an aortic thrombosis extending up to the level of the renal arteries (2), an aortic aneurysm situated in the region of the 11th to 12th thoracic vertebrae, and a hemangioma of the liver with associated cirrhosis. In the course of the operation the 4 patients were given infusions of citrated blood, and high plasma citrate levels occurred during the infusions. One patient died with signs attributable to citrate intoxication. These observations induced the authors to study the metabolism of the infused citrate in dogs and in normal persons. A linear relationship between the rate of infusion of citrate and the rise in plasma citrate level was observed in normal men and dogs. For each 1 mg. of citrate infused per kilogram of body weight per minute, the rise in plasma citrate level was about 20 mg. per 100 cc. in dogs and 12.5 mg. per 100 cc. in man. By using a constant infusion technique, it was shown that in dogs about 40% and in man about 20% of the infused citrate was excreted in the urine, and the remainder was metabolically destroyed. In both dog and man lowering the body temperature to 28 or 29 C (82.4 or 84.2 F) by surface cooling (hypothermia) was shown to reduce the rate of metabolic destruction of citrate by 30 to 40%.

From these findings it would seem that the infusion of citrated blood at less than 1 pt. (540 cc.) in 5 minutes in an adult is unlikely to cause a dangerous rise in the plasma citrate level, provided reported to 22. Surgical treatment was carried out in all except 1 patient. Of the 21 patients operated on, successful dissection to free the ureters or kidney was carried out in 12, 3 were subjected to nephrostomy only, 2 had nephrectomies, and 4 had diagnostic laparotomies. Irradiation treatment was given to 3 patients; the doses were 600, 840, and 4842 to 6000 r. There was apparent improvement in 2 patients, but no improvement or histological change occurred in 1. So far no satisfactory cause has been proposed for the condition. The author believes that in some, and perhaps in most cases, it is produced by organization of a hematoma or of a fibrinous effusion. The treatment should be surgical.

Acute Pancreatitis and Hyperdiastasuria after Partial Gastrectomy. S. Wallensten. Acta chir. scandinav. 115:182-188 (No. 3) 1958 (In English) [Stockholm].

The author reports an analysis of the incidence of fatal acute pancreatitis and the occurrence of hyperdiastasuria after gastric resection (Billroth types I and II) in patients with peptic ulcer. In a series of 1,769 Billroth II resections there were 12 deaths caused by acute postoperative pancreatitis, while in a comparative series of 605 Billroth I resections there were no deaths attributed to acute postoperative pancreatitis. Hyperdiastasuria occurred in 18 patients (16%) after 117 Billroth II resections and in 5 patients (9%) after 55 Billroth I resections. The difference in the incidence of hyperdiastasuria after the Billroth I and II resections is not considered significant. Whether there is penetration of the ulcer into the pancreas does not seem to affect the incidence of postoperative pancreatic disturbances. Thus, operative treatment may be extended and need not be limited to palliative resection. Although the etiology of postoperative pancreatic disturbance (acute pancreatitis and hyperdiastasuria, respectively) is still relatively obscure, analysis of the data would seem to indicate that their cause is related in some way to the operative method. Duodenal and afferent loop stagnation are adjudged as being of importance in the etiology of postoperative disturbances after Billroth II gastric resections.

Studies During the Immediate Postoperative Period Following Total Body Perfusion. E. C. Matthews, L. C. Clark, F. K. Edwards and others. A. M. A. Arch. Surg. 77:313-318 (Sept.) 1958 [Chicago].

The authors carried out physiological studies during perfusion and the immediate postoperative period in 10 consecutive patients, between the ages of 1 and 15 years, who were operated on for various congenital cardiac defects. Results showed that, if patients are perfused with fully oxygenated blood of normal pH at a rate which yields venous oxygen saturation in excess of 50%, metabolic acidosis does not occur. There is no need to perfuse at alkaline pH's in anticipation of ensuing metabolic acidosis or to administer alkali during the postoperative period. In the postoperative period, a more or less constant pattern for all the patients appeared from the intermittent arterial sampling. Initial pH values were usually low, the lowest being 7.25, but they showed a steady rise, so that most were normal by 3 hours and all were within the range of normal by 6 hours. The carbon dioxide contents initially were elevated and remained so during the sampling period. The carbon dioxide pressure likewise was initially elevated but showed a tendency to fall during the sampling period. The over-all picture was one of mild respiratory acidosis.

Thus, postoperative respiratory acidosis, comparable to that reported in patients undergoing thoracotomy for procedures not involving perfusion, may occur, but it is mild and of short duration. Sudden postoperative deaths, ascribed by other workers to oxygen toxicity, did not occur in these patients, and evidence of oxygen toxicity was not observed in these or other patients who were consistently perfused at arterial oxygen tensions ranging between 500 and 550 mm. Hg. The potential hazard of producing oxygen bubbles in the patient's arterial system exists, since the solubility of oxygen in blood is decreased with increasing temperatures: it is, however, obviated if the blood in the pump-oxygenator is maintained at the temperature of the patient's blood.

Acute Necrotizing (Pseudomembranous) Enterocolitis. A. W. Kay, R. L. Richards and A. J. Watson. Brit. J. Surg. 46:45-57 (July) 1958 [Bristol, England].

The authors report on 1 woman and 15 men, between the ages of 27 and 67 years, with acute necrotizing (pseudomembranous) enterocolitis. Of the 16 patients, 14 had been subjected previously to abdominal operations, and the enterocolitis occurred in them as a postoperative complication. The operation which most frequently preceded the condition was gastrectomy. The enterocolitis was associated with heart disease in the remaining 2 patients. The outstanding clinical feature of the 16 patients was the rapid development of a state of irreversible acute peripheral circulatory failure. Diarrhea was an inconstant feature, but it was sometimes severe. Symptoms occurred within 2 to 6 days after the surgical intervention, and all the patients died within 48 hours of the onset.

Autopsy which was performed on all 16 patients revealed that necrosis of the intestinal mucosa, associated with thrombotic occlusion of the related capillaries and venules, was the most prominent pathological feature. The changes may be widespread, localized, or focal in distribution, and they may occur in any part of the small or the large intestine and occasionally in the stomach. Superficial inflammatory exudation was not a constant finding, although in many patients it did constitute a distinct pseudomembrane. Concerning the causation and pathogenesis of the disease, the authors were unable to confirm the concept that a vasomotor disturbance associated with shock may be a causal condition. Before ascribing a causative significance to antibiotics, it should be noted that necrotizing enterocolitis was recognized, particularly as a postoperative complication, for many decades before their introduction. The hypothesis that necrotizing enterocolitis is directly due to infection of the intestine by enterotoxin-producing strains of Staphylococcus pyogenes var. aureus must be regarded as unproved, and there is considerable circumstantial evidence against the acceptance of this concept. Staphylococcic enteritis and acute necrotizing enterocolitis are probably not directly related, although they may occur together. Attention should be paid to the possibility that other bacteria, such as varieties of Clostridium welchii, might be the cause of acute necrotizing enterocolitis; the possibility that the disease may be due to a virus infection should also be considered. In the postoperative cases the clinical diagnosis between acute necrotizing enterocolitis and high obstruction of the small intestine is difficult; immediate laparotomy is, therefore, advised. Treatment for shock and the administration of erythromycin and adrenal hormones have so far proved ineffective.

Internal-Mammary-Artery Ligation for Angina Pectoris: Its Failure to Produce Relief. R. G. Fish, T. F. Crymes and M. G. Lovell. New England J. Med. 259:418-420 (Aug. 28) 1958 [Boston].

The authors report on the results of bilateral internal mammary artery ligation in a group of 24 selected patients with moderate or severe angina pectoris. All the patients were males, ranging in age from 32 to 64 years. In 22 patients the diagnosis of angina pectoris was made on the basis of a classic history, with transient electrocardiographic ST-segment or T-wave changes accompanying pain, or electrocardiographically proved transmural myocardial infarction at some time in the past. The character, duration, and progression of pain, requirements of glyceryl trinitrate (nitroglycerin), exercise tolerance, and occupational history were carefully noted. Eleven patients (46%) had previous transmural myocardial infarction; 10 (42%) had angina decubitus on admission. In 20 of the 24 patients on whom internal mammary artery ligation was performed, there was an initial marked improvement in the immediate postoperative period, which lasted for approximately 10 to 60 days. This period of improvement was marked by electrocardiographic stability, an increased exercise tolerance, and a reduction in the quantity of glyceryl trinitrate required. This improvement was particularly dramatic in patients who entered the hospital with angina decubitus and who continued to have occasional episodes of rest angina up to the time of operation—an improvement which in the light of subsequent findings is difficult to explain. Two patients died during the subsequent follow-up period, one patient succumbing 3 months after operation of bronchopneumonia complicating influenza, the other death occurring 5 months after operation as a direct result of coronary artery disease. In most of the remaining patients there was definite regression, with development of recurrent angina. The condition was such that at the time of writing there were only 4 patients who in their own opinion experienced moderate improvement and 2 who believed that they were slightly improved. In the remaining 18 patients the anginal syndrome resumed its preoperative course. Whether or not the survival time of these patients has been increased by an operation that failed to alter symptoms is an interesting speculative aspect of this and other surgical attempts to revascularize the myocardium.

Citrate Intoxication: A Clinical and Experimental Study. J. Ludbrook and V. Wynn. Brit. M. J. 2:523-528 (Aug. 30) 1958 [London].

The authors report on 3 men, between the ages of 24 and 55 years, and on a 44-year-old woman who were operated on with the aid of hypothermia for the following conditions: an aortic thrombosis extending up to the level of the renal arteries (2), an aortic aneurysm situated in the region of the 11th to 12th thoracic vertebrae, and a hemangioma of the liver with associated cirrhosis. In the course of the operation the 4 patients were given infusions of citrated blood, and high plasma citrate levels occurred during the infusions. One patient died with signs attributable to citrate intoxication. These observations induced the authors to study the metabolism of the infused citrate in dogs and in normal persons. A linear relationship between the rate of infusion of citrate and the rise in plasma citrate level was observed in normal men and dogs. For each 1 mg. of citrate infused per kilogram of body weight per minute, the rise in plasma citrate level was about 20 mg. per 100 cc. in dogs and 12.5 mg. per 100 cc. in man. By using a constant infusion technique, it was shown that in dogs about 40% and in man about 20% of the infused citrate was excreted in the urine, and the remainder was metabolically destroyed. In both dog and man lowering the body temperature to 28 or 29 C (82.4 or 84.2 F) by surface cooling (hypothermia) was shown to reduce the rate of metabolic destruction of citrate by 30 to 40%.

From these findings it would seem that the infusion of citrated blood at less than 1 pt. (540 cc.) in 5 minutes in an adult is unlikely to cause a dangerous rise in the plasma citrate level, provided that the rate of citrate metabolism is not reduced. However, in metabolically abnormal patients, with liver disease or with anuria, in those whose body temperature has been rendered abnormally low, or in those with impaired liver circulation or application of clamps to the thoracic or the high abdominal aorta, the ability to clear the plasma of citrate may be so impaired as to make high plasma citrate levels a real danger. If there are good resons for suspecting that a high plasma citrate level is the cause of otherwise unexplained hypotension or cardiac arrhythmia, calcium chloride should be given. Prevention is possible in planned surgical procedures when blood may have to be given rapidly (and when one or more of the circumstances which depress the rate of clearance of citrate from the plasma are present) by having available blood collected without the use of citrate.

Surgical Treatment of Pulmonary Valvular Stenosis. J. Pliego. Gac. méd. México 88:481-505 (July) 1958 (In Spanish) [Mexico, D. F.].

Twenty-four patients with a diagnosis of congenital pulmonary valvular stenosis were observed at the Instituto Nacional de Cardiologia, of Mexico City, between 1952 and 1958. Nine patients had pure pulmonary valvular stenosis, and 15 had this malformation with interatrial communication (Fallot's trilogy). The interventricular septum was normal in all the patients. One patient died of ventricular fibrillation in the course of transventricular exploration of the pulmonary valve before valvulotomy. In the remaining 23 patients the treatment consisted of a valvulotomy, alone or with closure of the gap in the interatrial septum. In the group of patients with pure pulmonary valvular stenosis, there was no operative mortality from either transventricular or transatrial valvulotomy. One patient died one week after transatrial valvulotomy of purulent pericarditis. In the group of patients with Fallot's trilogy, there were 2 operative deaths from transatrial valvulotomy: One patient died of cerebral anoxia during extracorporeal oxygenation, and the other of arrest of the heart during hypothermia. Two other patients with Fallot's trilogy died after transventricular valvulotomy, 4 hours and 4 days, respectively, after the operation. One patient died of cerebral anoxia, and the other of acute insufficiency of the left heart. Eight patients with the pure valvular malformation and 10 with Fallot's trilogy are living, more than 4 years having elapsed since the operation.

Preoperative and postoperative clinical observations and the results of electrocardiograms and of roentgenograms of the chest and of angiography, as well as the results obtained from catheterization of the right heart, proved that the transatrial technique is far superior to the transventricular technique. In patients with pure pulmonary valvular stenosis the increase in oxygen saturation of the peripheral arterial blood was more marked after the transatrial than after the transventricular operation, and the gradient of systolic pressure between the right ventricle and the pulmonary artery was either normal or greatly improved. In patients with Fallot's trilogy the results of the operation with either technique were fair. Oxygen saturation of the peripheral blood increased from 87 to 93%. Evaluation of either technique is difficult, because the results of the operation depend on the severity of the predominant malformation, either valvular or septal. The author concludes that the ideal operation for pulmonary valvular stenosis alone or with Fallot's trilogy is transatrial valvulotomy, which permits opening of the arterial valve down to the ring or else resection of a segment of the valvular apex. Transatrial valvulotomy prevents damage to the right ventricle during the operation. *It is not followed by cardiac insufficiency or by* postoperative mortality. The systolic pressure in the ventricle becomes normal or almost normal. The systolic pressure of the pulmonary artery increases. The interatrial gap is easily closed under direct vision. In cases of Fallot's trilogy, with the lesser circulation maintained by ventricular hypertension in the presence of a small foramen ovale, the correction of the valvular condition alone results in controlling the lesser circulation. Exclusion of circulation in cases of pure pulmonary valvular stenosis should be made with the patient under hypothermia, unless there is an infundibular lesion, and in this case the extracorporeal oxygenation should be used. In cases of Fallot's trilogy, transatrial valvulotomy under extracorporeal circulation facilitates correction of both the interatrial and the septal malformations in a short time. The period of extracorporeal circulation should never exceed 8 minutes for the correction of each abnormality. Transatrial valvulotomy is indicated in all patients with pulmonary valvular stenosis or with Fallot's trilogy. The patients regain a normal status after the operation.

The Conservative Treatment of Hemangiomas in Infants and Children. H. M. Blackfield, F. A. Torrey, W. J. Morris and B. V. A. Low Beer. J. Internat. Coll. Surgeons 30:255-261 (Aug.) 1958 [Chicago].

Spontaneous involution of hemangiomas of infancy and childhood was reported in the literature as early as 1888, although it was not until the appearance of Lister's paper in 1938, in which he reported a clinical study of 97 children with involuting hemangiomas, that adequate attention was focused on this phenomenon. During the 4 years of the present study, in which the authors wished to verify the occurrence of spontaneous involution and to observe its various stages, they were impressed by the fact that the lesions in patients undergoing treatment were involuting in the same manner as the untreated ones, thereby casting serious doubt upon the effectiveness of treatment. The following classification has been devised to differentiate between the involuting and the noninvoluting type of hemangioma: (1) involuting (infants)—superficial, combined (superficial and deep), and deep; and (2) noninvoluting (adults)—port-wine stain (nevus flammeus) with or without subsequent growth, true cavernous with or without subsequent growth, and venous racemose aneurysms and arteriovenous fistulas.

When surgical treatment is forced by parental pressure and is attempted during the growing phase of the large involuting type of hemangioma, the tumor can rarely be completely excised, and growth will continue in the residual vascular tissue until the latent period is reached. If operation is delayed until involution has commenced, a more conservative excision can be accomplished, as the vascular tissue will involute spontaneously. Plastic surgical measures are necessary to remove the residual disfigurements of the large hemangioma; however, such procedures, when performed a number of years after the involution of a large hemangioma, are much simpler and less dangerous than when attempted in infancy. Radical methods of treatment that may damage or prevent the growth of normal tissues are contraindicated.

The Management of Vascular Tumors. K. L. Stephenson. J. Internat. Coll. Surgeons 30:229-248 (Aug.) 1958 [Chicago].

Until such a time as criteria are available that will permit definitive differentiation of the aggressive from the regressive angiomatous tumors, these tumors are best managed by surgical excision. Surgical excision should be undertaken at the first appearance of the tumor so far as the welfare of the patient is concerned. Excision can often be accomplished with the patient under local anesthesia or, on an outpatient basis, under brief general anesthesia. Management of these neoplasms is minimized in the event of early surgical intervention, which prevents extension and complication of the growth. In the present series no recurrence was noted after surgical excision, despite the fact that many of the patients were operated on during a period of tumor growth.

Forcible Blood and Fluid Injection into the Arterial System for Patients in Terminal States. V. P. Radushkevich. Vestnik khir. 81:15-19 (Aug.) 1958 (In Russian) [Leningrad].

The author evaluates the method of forcible blood and fluid injection developed by V. A. Negovski in the treatment of terminal cases. The method consists of injection under pressure of blood and blood substitutes into the peripheral arteries or into the ascending aorta. The author reports on 224 patients who when dying were treated by this method. The treatment was successful in 47.2% of the patients, in 29.5% the response was transient only, and in 23.1% there was no response. Twenty-four of the patients were treated by blood transfusion into the aorta; 9 of these have recovered, the transient improvement only of the remaining 15 being due to injuries which were incompatible with life. Of the 40 neurosurgical patients in severe shock, with blood pressure readings of 40 to 50 degrees of mercury column, 18 have recovered. In 11 cases of clinical death, 6 patients have recovered, and of 3 patients in the agonal state, 1 has recovered. The author advocates forcible intra-arterial blood transfusion in general surgical practice and in severe neurosurgical cases.

Intraosseous Blood and Plasma Transfusion in Children. N. P. Lapshina. Vestnik khir. 81:42-44 (Aug.) 1958 (In Russian) [Leningrad].

The author reports on intraosseous blood and plasma transfusion in 118 infants and children, whose ages ranged from birth to 14 years. In the majority of the cases operative shock or hemorrhage required blood transfusion. The quantity of the transfused blood and plasma varied from 30 to 200 cc. In 84 of the patients the superior tibial metaphysis was used, in 61 the inner malleolus, and in 12 the exterior condyle of the femur. The author emphasizes that in young children the sternum should not be employed for this purpose. The intraosseous administration of blood and plasma was found to be very effective as an antishock measure and is advocated by the author as the method of choice for blood transfusion in infants and in children.

Early Surgical Correction of Inguinal Hernias in Infancy and Childhood. W. B. Kiesewetter. A. M. A. J. Dis. Child. 96:362-367 (Sept.) 1958 [Chicago].

The author reports on the results of 453 inguinal herniorrhaphies: 410 (91%) of this series were in boys; 43 (9%) were in girls. The right side was involved in 41%, the left in 19%, and both sides in 40%. Although both the direct and the indirect types of inguinal hernias are possible in children as in adults, the indirect variety is the only one that is of significance, as 99.6% of the 453 inguinal herniorrhaphies reported were of that type. Two possibilities exist in the pathogenesis of indirect inguinal hernia: 1. The processus vaginalis may never go on to complete fusion. 2. A closed processus vaginalis may be wedged open by an increase in intra-abdominal pressure. In either event a communication exists between the peritoneal cavity and the inguinal-scrotal area.

The age at onset of symptoms in 130 (54%) of the 243 patients whose parents replied was 6 months or less. Twenty-four of the 453 patients were admitted to the hospital because of an incarceration;

16 of the infants were under one year of age. Six of the patients required emergency surgery as the incarceration could not be reduced. There were only 2 recurrences in the 243 patients followed up, a rate (0.8%) that compares favorably with the 5 to 10% recurrence in adults. Only 4 of the patients had even slight asymmetry between the testes. Complications from the procedure were of 3 types: wound infections (8); "collodion burns" (2); and iatrogenic cryptorchidism (2). Of the 6 courses supposedly available for the correction of inguinal herniation—permitting spontaneous resolution; aspiration in the event of hydrocele; injection of sclerosing agents; preoperative medication, elevation of the foot, and application of an ice bag to the affected area; wearing of trusses; and surgery—the latter is, in the opinion of the author, the only rational and correct method of therapy for the condition.

NEUROLOGY & PSYCHIATRY

"Sodium Chloride Plombage" Used for Prevention of Complaints After Lumbar Puncture. G. Harrer. Medizinische, no. 29/30, pp. 1132-1133 (July 26) 1958 (In German) [Stuttgart, Germany].

During the past year the author performed 136 lumbar punctures in the neurological department of the District Hospitals in Salzburg, Austria. Immediately after the puncture, 10 to 20 cc. of isotonic sodium chloride solution, depending on the amount of the removed cerebrospinal fluid, was injected into the epidural space. By this technique, drainage from the puncture point, the main cause of a patient's complaints after the puncture, was prevented. The epidural sodium chloride plombage acts as a liquid cushion, which prevents the escape of cerebrospinal fluid from the spinal space into the epidural space. The method is simple, free from risk, and may be performed without notable expenditure of time and money. Only 3 of the 136 lumbar punctures were followed by mild complaints. The same satisfactory results were obtained with 100 lumbar punctures performed according to the same method at the neurological clinic of the University in Innsbruck, Austria.

Suicidal Poisoning. F. G. Norbury. Illinois M. J. 114:99-101 (Sept.) 1958 [Chicago].

Suicidal deaths occur in the United States at the rate of 17,000 per year. Although ingestion of poisons ranks below firearms and hanging as causes of suicide, poisonings account for about 80 suicidal deaths a year in Illinois. Most suicidal attempts do not end in death, and they frequently go unreported, so that no accurate figures are available as to their incidence. Every hospital emergency room has experience with such cases; they form an important segment of emergency medical practice. Friends or relatives usually bring poisoned individuals under medical observation before death supervenes, and suicidal poisoning usually can be successfully treated. Patients who attempt suicide with barbiturates and other hypnotic drugs usually obtain these drugs on prescription. These patients often make the rounds of several physicians and clinics and accumulate several prescriptions before the attempt is made. With the recent increasing popularity of newer sedatives and ataractic drugs, suicide attempts with these products will occur more frequently. Attempts have been reported with glutethimide (Doriden), meprobamate (Miltown, Equanil), and chlorpromazine (Thorazine).

Because suicide attempts so frequently involve the use of prescription drugs, the medical profession must bear some of the responsibility for their prevention. The possibilities of a suicidal trend should be considered in patients whose symptoms are of an emotional nature or are vague. Evidences of depression, impulsive behavior, obsession with insomnia, deficiencies in judgment, and alcoholism are all signs that should lead to wariness in prescribing large doses of sedatives. Care in prescribing involves limitations on amount and on refills. The patient-physician relationship may be a powerful factor in suicide prevention. Patients often welcome the chance to talk about their depression and suicidal thoughts if the opportunity is offered them by the physician. When suicidal trends are suspected, it is imperative to inform a member of the family of the risk, and it may be necessary to have the family control the supply of drugs. The method of attempted suicide may offer clews to the personality of the patient and act as a guide to therapy.

Aneurysms of the Middle Cerebral Artery: A Report on 52 Cases. G. af Björkensten and H. Troup. Acta chir. scandinav. 115:153-159 (No. 3) 1958 (In English) [Stockholm].

During the years from 1937 to 1956, 184 patients with intracranial aneurysms were admitted to the department of neuro-surgery of the Finnish Red Cross Hospital in Helsinki. Of the 184 patients, 52 had aneurysms of the middle cerebral artery, 27 of which were on the left side and 21 on the right. Two patients had bilateral aneurysms. One patient had aneurysms of the right middle cerebral and left pericallosal arteries, and another had bilateral middle cerebral aneurysms with a third aneurysm of the left pericallosal artery. Thirty-five of the patients were subjected to surgery—carotid ligature was not done in any instance—and the remaining 17 patients were treated conservatively. Fifty-one of the patients had shown the typical clinical picture of subarachnoid hemorrhage, and this finding was confirmed by lumbar puncture in 43. Eighteen patients had no focal neurological signs; 22 patients were or had been at one time hemiplegic or hemiparetic; and in 2 patients (1 of whom was hemiplegic), who exhibited hemianopsia, a temporal expansion was found at angiography. In all 23 patients with focal signs the aneurysm was found on the contralateral side. Approximately half of the patients exhibited definite lateralizing signs. Of the 17 patients treated conservatively, 9 died of recurrent hemorrhage at the following intervals: 3 within 10 days, another 3 within a month, 1 at 4½ months, and 2 over 2 and 3 years, respectively, after the initial hemorrhage. One patient survived, severely disabled for 2½ years, but with no symptoms of recurrent hemorrhage, only to die of cancer of the lung.

Four (11%) of the 35 patients operated on died. Postoperative angiograms performed on 21 of the 31 surviving patients revealed that in 11 cases there was no filling of the aneurysm, in 5 the aneurysm was still filling, and in 5 others the aneurysm was in much the same condition as it was preoperatively. No patient surviving operation has died, nor have any had symptoms suggestive of recurrent subarachnoid hemorrhage. In 7 patients there was hemiparesis or hemiplegia preoperatively, and in 3 more it was noted immediately after operation, while 1 other patient developed hemiplegia 15 days after operation. Only one patient in the entire group was hypertensive, although all the patients were over 40 years of age. Of those patients who had epilepsy preoperatively, 1 died, while the other 2 have been controlled by antiepileptic medication. Of the 7 who had epileptic seizures postoperatively, 6 had electroencephalographic foci in the corresponding frontotemporal region, and 1 had generalized epileptic dysrhythmia. The authors draw attention to the advisability of prophylactic epileptic therapy and suggest that hypothermia will prove particularly valuable in this type of aneurysm in which, for anatomic reasons, complications will perhaps always be more frequent than in aneurysms in other locations.

Transillumination of the Infant Head Demonstrated by a Case of Hydranencephaly. J. Griffiths. South African M. J. 32:773-774 (Aug. 2) 1958 [Cape Town].

Transillumination of the infant head is a sign deserving of greater prominence, inasmuch as it is simple to elicit and requires only a darkened room and a source of illumination—a pocket torch has been used with success. Normally, and where the cerebral cortex is more than 1 cm. thick, the test is negative, and the head does not transilluminate. When hydranencephaly is present or when the cerebral cortex is very thin, a light placed behind the head in a darkened room will light up the entire head with an orange-red light, giving an appearance rather like a Chinese lantern. The vessels of the scalp and the basal structures of the brain stand out in dark contrast to the reddish glow of light through the brain.

The transillumination test was negative in one infant with an enlarged head, and upon admission to hospital it was determined that the baby was an early and suitable case for operation. A second infant showed a strikingly positive test. The patient —believed to be the first reported case of hydranencephaly in a South African Bantu—was a plump infant with a large head measuring 19½ in. in circumference. An electroencephalogram showed little or no electric activity on the left side; on the right, however, high-voltage delta activity was recorded. Five months later the child had shown no neurological improvement, irritability had increased, and the head had enlarged to a circumference of 22½ in.

Paragonimiasis of Central Nervous System: Observations on 76 Cases. Y. C. Shih, Y. H. Ch'en and Y. C. Chang. Chinese M. J. 77:10-19 (July) 1958 (In English) [Peking].

The authors report on 1 female and 75 male patients with paragonimiasis of the central nervous system, who were admitted to the neurological service of the First Medical College in Shanghai between 1951 and 1955. Paragonimiasis is a parasitic disease caused by the lung fluke, Paragonimus westermani. The lung was involved in all 76 patients, who had cough, hemoptysis, and chest pain. The brain was involved in 71 patients, whose symptoms consisted of headache, epileptic seizures, and motor disability. The site of predilection was the temporal lobe. The spinal cord was involved in 8 patients, 3 of whom also had involvement of the brain. Of 69 patients subjected to roentgen-ray examination of the skull, only 9 showed abnormal findings, with osteoporotic lesions in the dorsal region of the sella turcica and enlargement of the hypophysial fossa, indicating increased cranial pressure. Two patients had a discernible side-to-side shift of the calcified pineal gland. Pneumoencephalographic studies revealed evidences of a mass-occupying lesion mixed with various degrees of brain atrophy in many patients. While pneumoencephalography was of great diagnostic importance, cerebral angiography was of little aid in the diagnosis of the disease.

Thirty-one of the 76 patients were subjected to 33 operations. Complete resection of the lesion was performed in 12 patients, and an adult worm was found in 8 of these; in 2 of 12 patients in whom partial resection was done, an adult worm was detected. Four patients died in the immediate postoperative period, and 2 others died after 6 months and 1 year, respectively, the causes of death being apparently unrelated to the operation. Of the 25 surviving patients, 14 were well without much handicap, 3 had occasional epileptic attacks, and 8 were seriously crippled. Of the 40 patients not operated on because of relative mildness of clinical symptoms, inability to localize the lesion, or wide spread of brain atrophy, 2 died. Of the 38 surviving patients, 7 were markedly disabled, 6 had repeated epileptic attacks, and 25 had headache, impairment of vision, or some other neurological symptoms.

Adult worms were found in 15 (40.5%) of 37 patients either in the course of the surgical intervention or at autopsy. These findings support the concept that involvement of the central nervous system by paragonimiasis is due to direct invasion by the worm rather than to egg embolism for which no evidence was found. The authors agree with other workers that an adult worm is able to migrate within the host, and they believe that, in case of brain involvement, the path of entry of the worm is through the carotid canal. The anatomic proximity of the carotid canal to the basal portion of the temporal lobe, the site of predilection of the brain lesion, is emphasized. All the patients had 3 or 4 courses of emetine and chloroquine therapy before they were operated on; yet, in their brains living worms were still present. Hence, to remove the worms and, thus, protect the nerve tissue from further damage, surgical treatment is required. Surgical treatment is contraindicated in patients with focal or diffuse brain atrophy, in those in whom the disease focus is so extensive that complete resection is impossible, and in the acute meningoencephalitic stage of the disease.

GYNECOLOGY & OBSTETRICS

The Stein-Leventhal Syndrome: A Curable Form of Sterility. I. F. Stein Sr. New England J. Med. 259:420-423 (Aug. 28) 1958 [Boston].

The Stein-Leventhal syndrome consists of a history of secondary amenorrhea and sterility, the finding of bilateral and symmetrically enlarged ovaries, and the excretion of normal amounts of 17-ketosteroids and follicle-stimulating hormone in the urine. In approximately 30% of the patients there is a varying degree of hirsutism; there is no virilism. The breasts are smaller than normal in 50% of the patients, and there is uterine hypoplasia in 75%. The direct diagnosis of the Stein-Leventhal syndrome rests upon the history and upon physical and pelvic findings corroborated by or first revealed by one of the following visual methods of diagnosis: (1) gynecography (pneumoroentgenography); (2) culdoscopy; (3) colpotomy; and (4) laparotomy.

Trials in patients with the Stein-Leventhal syndrome with endocrine therapy, roentgenotherapy, and no treatment at all have failed to result in permanently restored reproductive function. By proper wedge resection more than 85% of the patients in the author's series have been rendered ovulatory, as proved by the occurrence of pregnancy, and the fertility has been maintained throughout the woman's normal reproductive span. The operation is essentially one of decompression of the ovaries rather than the removal of ovarian tissue. In all probability simple incision and puncture or multiple punctures alone may render a favorable result. Seventy-one of 96 patients were included in follow-up studies, from the standpoint of fertility, with the following results: 1. Sixty-three patients (88.7%) became pregnant one or more times. 2. One hundred forty-three pregnancies resulted, with 119 live births, including 4 sets of twins. 3. Two patients were undelivered at the time of this report. 4. Twenty-four patients had either miscarriages or stillbirths. In this series there were no ectopic pregnancies, no carcinoma of the endometrium, and no recurrence of bilateral polycystic ovaries. Although menses were restored in 95% of the women after surgical resection of the ovaries, one patient was amenorrheic for an entire year; she then began to menstruate spontaneously and has continued to do so regularly. Selectivity of patients for wedge resection is of prime importance. Neither the complaint of sterility nor amenorrhea alone is sufficient basis in itself to justify surgical intervention.

Carcinoma of the Cervical Stump. J. C. Ullery and B. V. Bisca. Am. J. Surg. 96:360-364 (Sept.) 1958 [New York].

Despite the low mortality and morbidity of total hysterectomy today, the incidence of carcinoma of the cervical stump after supracervical or subtotal hysterectomy remains practically unchanged from that of 10 or 15 years ago. During the past 18 years 82 patients with cancer of the cervical stump have been seen among a total of 1,027 patients treated for cervical cancer. Of these 82 cases, 58 (70.7%) were "true" cases and 24 (29.3%) were "coincident" cases of carcinoma of the cervical stump, the "coincident" cases being defined as those in which the diagnosis was made within 2 years from the time of supracervical hysterectomy, and it was interpreted that cancer existed at the time of the original operation. If the malignant lesion was manifested after that time, it was listed as a "true" case and was presumed to have developed after the operation. Thus, in nearly one-third of the cases in which the diagnosis of cervical stump carcinoma was established, the malignancy was present when the initial operation was performed.

The ages of the 82 patients ranged from 32 to 78 years, with a mean average of 52 years. Thirty (36.6%) of the 82 patients had never been pregnant. The latter figure is surprising, as parity has seemed to have more than a casual relationship to cervical carcinoma. The ages at which the nulliparous patients had their supravaginal hysterectomies performed varied from 18 to 52 years, and 10 of the nulliparous patients had undergone subtotal hysterectomy before the age of 30, which may help to explain the low fertility of the entire group but leaves unexplained the indications for subtotal hysterectomy in this age group. The majority of the subtotal hysterectomies were performed for uterine fibroids. More than one-half (49) of the patients classified (International Classification) fell into the stage 2 and stage 3 categories, showing the degree to which the cancer had progressed beyond the limits of the cervix by the time the patient had made her initial visit to the clinic. Only 5 of the stage 2 patients have survived, 3 of them for 5 years or more. Each of the 3 is living with disease, complicated by rectovaginal fistula in the first and third patients and by colostomy and chordotomy in the second. Only 1 of the 11 patients with stage 4 cancer is living 4 years after treatment and with disease complicated by colostomy and chordotomy. The total 5-year survival rate for the 82 patients has been 35%.

The therapy given to the 82 patients was basically radiation, consisting of either radium or radiocobalt (Co^{60}) administered intravaginally and usually followed by external radiation; several patients received Co^{60} intracervically. In recent years selected patients have received intravaginally administered Co^{60}, followed by radical cervicectomy and bilateral pelvic lymph-node excision. When hysterectomy is indicated, the only operation justified is total hysterectomy, as this method offers the only absolute method of eradicating carcinoma of the cervical stump. In all patients on whom hysterectomy is to be performed, a thorough study of the cervix by cytological and biopsy methods and the routine dilatation and curettage of the fundus and cervical canal must be done.

PEDIATRICS

School Epidemics of Tuberculosis. R. Mande, A. Herrault, P. Loubry and C. Bouchet. Semaine hôp. Paris 34:1837-1842 (June-July) 1958 (In French) [Paris].

Epidemics of tuberculosis have changed greatly in recent years. Infection occurs at a much higher age than before, and tuberculosis has become rare in small children except in cases of direct family contamination. In contrast to this general tendency, collective contamination of children in schools has become more common and often has such an explosive spread that these group infections have been called "school epidemics of tuberculosis." These collective school epidemics have increased in recent years in France. From the epidemiologic point of view this fact is not surprising. The epidemic spread of tuberculosis is only possible if most of the population concerned has never been exposed to Mycobacterium tuberculosis, and this is now largely true of children of school age in France. Tuberculosis in school epidemics is characterized by the appearance of the disease in an unusually large number of children, by the relatively short time within which the cases occur (an average of 8 weeks), and by the frequency of severe forms. It is to be noted that no instance of collective contamination was observed when the children in a school had been vaccinated with BCG.

The origin of the tuberculous infection was established in 19 of 25 school epidemics studied by the authors. In 10 of these outbreaks, it could be traced to the teacher, in 8 to a pupil, and in 1 to a member of the auxiliary personnel. The knowledge that group contamination may occur in schools makes regular examination of both pupils and members of the teaching staff essential.

Study of the Medullary Iron in the Course of Acute Rheumatic Fever in Children. M. Bernheim, C. Mouriquand and D. Germain. Semaine hôp. Paris 34:1813-1871 (June-July) 1958 (In French) [Paris].

This study of medullary iron in patients with acute rheumatic fever is based on 119 myelograms obtained from 87 children, ranging in age from 5 to 15 years. The acute stage of rheumatic fever is marked by a fall in the number of sideroblasts, contrasting with an increase in extraerythroblastic iron, which is often considerable. Normalization of the medullary iron level occurs when the inflammatory process subsides, either spontaneously or, even more often, as a result of therapy. The changes observed in the present series were particularly distinct in the initial stage of the disease, i. e., the first 10 days after the onset of the articular manifestations. The restoration of the medullary iron to normal was found in 46 myelograms obtained after treatment with deltacortisone or hydrocortisone, given in the usual doses, for from 1 to 8 weeks. The sideroblast level was equal to or higher than 20% in 39 of the 46 patients (84.8%). The extracellular iron was considerably reduced: in 34 patients it was normal (0 to 1+); in 10, 2+; and in 2, 3+, which was the highest level observed.

The significance of these changes in the medullary iron becomes clear in the light of studies by many workers on iron metabolism in the course of infection. These studies show that in the presence of inflammation iron is blocked in the reticuloendothelial system; it is turned aside from its normal end, which is hematopoiesis. Cytological studies of medullary iron by the prussian blue reaction have illustrated this phenomenon in patients with acute rheumatic fever, showing that iron cannot penetrate into the interior of the erythroblast in the acute stage of the disease and that, therefore, it accumulates in the reticular cells of the marrow. Normal utilization of iron is restored when the inflammatory process disappears.

The rapid normalization of medullary iron under the influence of corticoid therapy brings up the question of corticoid hormone intervention in iron metabolism. Recent studies seem to show that the principal action of the corticoid hormones is to facilitate iron absorption by the cells able to use them. According to this, corticoid therapy would act directly on the sideroblastic changes. In any case, the rapid suppression of the inflammatory process remains the primary factor in the normalization of medullary iron. Comparison of the level of medullary iron with that observed in the course of experimental acute scurvy reveals a striking similarity and suggests that the changes in patients with acute rheumatic fever may be explained by a decrease in ascorbemia. The possibility that there is a relation between vitamin C deficiency and rheumatic fever has already been mentioned by several workers.

Septicemia of the Newborn. W. L. Nyhan and M. D. Fousek. Pediatrics 22:268-278 (Aug.) 1958 [Springfield, Ill.].

The authors reviewed the records of all infants, less than 30 days of age, who were admitted to the pediatric service of the Grace-New Haven Community Hospital in New Haven, Conn., between January, 1933, and July, 1957, and from whom positive blood cultures were obtained. From these patients 70 boys and 36 girls were selected, in whom a diagnosis of neonatal septicemia was made according to Silverman and Homan's criteria for sepsis of obscure origin in the newborn infant. Males predominated in a ratio of 2 to 1. The mean age at onset was 9.6 days. Twenty-five of the 106 patients were less than 48 hours of age at onset. The results of blood cultures showed that the distribution of causative agents in recent years differed from that observed before 1944. During the period from 1933 to 1943 the beta-hemolytic, group A, streptococci were predominant infecting organisms, while between 1944 and 1957 infections with coliform organisms were the most common, although group A streptococcic infections continued to occur. Significant numbers of those patients observed in the last 15 years were found to be infected with Pseudomonas aeruginosa and with beta-hemolytic streptococci of groups other than A. Fever, abdominal distention, jaundice, and enlargement of the liver were the most common clinical manifestations suggesting sepsis. However, in most patients the clinical picture was one of general, rather vague systemic illness. The serious nature of neonatal septicemia and the difficulty of early diagnosis were emphasized by the over-all mortality rate of 72% (76 of the 106 patients).

Rapid institution of antibacterial therapy is essential, for infants with septicemia often die before definitive bacteriological results of blood cultures are available. Vigorous search for the infecting organism is imperative; if the infecting organism is known at the time of instituting therapy, the choice of the antibiotic is simplified. The drug of choice in patients with streptococcic and pneumococcic sepsis is penicillin; patients infected with coliform organisms are best treated with a broad-spectrum antibiotic, such as chloramphenicol or a tetracycline, with or without additional administration of streptomycin. For the initial treatment of severe staphylococcic infections, a combination of either chloramphenicol or erythromycin with a bactericidal drug, such as penicillin or streptomycin, would appear to be indicated. The general resistance of Ps. aeruginosa to most antibacterial agents is such that in the presence of this organism the use of polymyxin B combined with a broad-spectrum antibiotic would appear to be justified for initial therapy. The use of relatively large doses in initial antibiotic therapy is suggested by the rapidly fatal nature of the disease and the frequency of infection with resistant strains. Intensive therapy should be continued until the patient is free of signs and symptoms of infection and blood cultures are negative.

Eczema Vaccinatum. A. H. Reynolds and H. A. Joos. Pediatrics 22:259-267 (Aug.) 1958 [Springfield, Ill.].

The authors report the cases of 8 boys and 1 girl, between the ages of 2 months and 4 years, who were admitted to the Children's Hospital of Los Angeles with eczema vaccinatum. In only one of the children was the condition a complication to direct smallpox vaccination; in the others it was the result of contact between a child with atopic eczema and a recently vaccinated child, usually a sibling. Suddenly appearing umbilicated pustules and vesicles, limited in distribution to areas of atopic eczema on which they are superimposed, in an acutely ill child with fever and lymphadenopathy, are almost diagnostic of eczema vaccinatum or eczema herpeticum. Umbilicated lesions do not occur with mere secondary bacterial infection. Eczema herpeticum cannot be reliably distinguished from eczema vaccinatum by the character and distribution of the lesions or by the course of the illness. History of direct contact with a recent vaccination (3 to 21 days) or with a recent typical infection of herpes simplex is strong presumptive evidence for the specific cause. Hyperimmune vaccinia gamma globulin is now available for specific therapy. In the authors' series it was given intramuscularly in doses of 0.6 to 1 cc. per kilogram of body weight. Two of the 9 patients died. The others recovered without further complications, except one patient who suffered significant scarring of the face and resolved iridokeratitis.

Because of the serious nature of eczema vaccinatum the following steps are recommended for prophylaxis: 1. No child with atopic eczema or other skin disease should be vaccinated. 2. No child should be vaccinated if any member of his family has eczema or other skin disorder. 3. Parents of children with eczema should be notified at the onset of the disease of the danger from vaccination contact. 4. If a sibling of a child with atopic eczema is vaccinated, he must be completely separated from that child for at least 21 days. 5. Forms used by state and local health departments for parents' consent to vaccination should include an appropriate warning of the contraindications. 6. Eczema vaccinatum should be a reportable disease. 7. Patients recently vaccinated must be excluded from pediatric wards containing patients with atopic eczema, other diseases of the skin, burns, or healing surgical incisions. 8. Vaccination may be recommended at 2 months of age, especially for babies from strongly allergic families.

Clinical Signs of Neonatal Tetany: With Especial Reference to Their Occurrence in Newborn Babies of Diabetic Mothers. W. S. Craig. Pediatrics 22: 297-308 (Aug.) 1958 [Springfield, Ill.].

The author describes the occurrence of hypocalcemic tetany in 7 newborn infants. All the babies were born prematurely, 6 of them to mothers with a history of diabetes mellitus. The mother of the 7th infant was obese and had a prediabetic type of glucose tolerance curve. Clinical signs of tetany appeared within 24 hours of birth. They were severe in 5 infants and mild in 2. Significantly low concentrations of calcium were determined in the serums obtained from the 5 infants with severe clinical manifestations of tetany; the lowest value observed was 2.6 mg. per 100 cc. In the 2 babies with mild clinical tetany the concentrations of calcium in the serum were also low but less dramatically so than in the more severely affected infants.

In discussing differential diagnosis of tetanic from nontetanic convulsions, clinical signs related to the presence of hyaline membrane, hypoglycemia, intracranial injury, and meningitis are considered. An observation of value is that in newborn babies, in whom hyaline membrane is later demonstrated at autopsy, respiratory embarrassment is detectable within about one hour of birth. In this series respiratory distress, occurring as part of the tetanic syndrome, did not appear at the earliest until some 6 to 12 hours after birth. The respiratory embarrassment in the infants with tetany was intermittent and lacked the insidious deterioration seen in premature babies with extensive hyaline membrane formation. Low concentrations of sugar in the blood were observed in only 1 of the 7 infants. In many respects the abnormal signs attributed by earlier workers to hypoglycemia resembled those associated with hypocalcemia in the 7 children.

The differential diagnosis of tetany from cerebral disturbance due to stress of birth is not always easy, and the 2 conditions may occur simultaneously in the same infant. In none of the infants did the circumstances of delivery suggest that the infant had been subjected to excessive or unusual stress, except insofar as all the infants with tetany were premature. Features of the hyperactive phases seen in the babies with tetany, distinguishing these phases from convulsions due to intracranial trauma, were their frequent onset in the absence of stimuli and immediately after a sudden apneic attack, the development of generalized neuromuscular excitability with no rhythmic movement pattern, and the expulsion of small masses of meconium. An unnatural quietness and almost absolute stillness followed periods of generalized neuromuscular agitation; this sudden change from wild excitability to silent immobility was not seen in any other neonatal condition. The possibility of intracranial infection was confidently excluded, since in each infant recovery was rapid and complete in the absence of antibiotic therapy.

Hypocalcemic tetany probably occurs with a significant frequency in babies newly born to mothers with diabetes mellitus. The occurrence of hypocalcemic tetany apparently is favored by the temporary decline which normally occurs soon after birth in the concentration of calcium in the serum, more particularly in premature babies. The disturbance of the normal maternal hormonal adjustments to pregnancy, and especially of adrenopituitary function in diabetic mothers, may be a determining factor.

Treatment of Tuberculous Meningitis of Children with the Exclusion of the Subarachnoid Method of Therapy. A. N. Shvedova. Pediatriya 36:23-25 (Aug.) 1958 (In Russian) [Moscow].

Shvedova reports on 32 children with tuberculous meningitis, who were treated with phtivazid (a vanilyl derivative of isoniazid) and with PAS by mouth and with streptomycin given intramuscularly. The drugs were not given by the subarachnoidal route. The improvement in the general state of the patients took place at an earlier date than it did in the children previously treated by the subarachnoidal route. The intoxication decreased, the temperature returned to normal, the meningeal symptoms disappeared, and the cerebrospinal fluid returned to normal. There were no complications.

Hyperthyroidism in Children. J. S. Hyde, M. A. Halpin and I. P. Bronstein. Illinois M. J. 114:45-51 (Aug.) 1958 [Chicago].

The authors report on 10 girls and 1 boy with hyperthyroidism, who were between the ages of 3 and 12 years at the time of onset of symptoms and were treated at the pediatric endocrinology clinic of the University of Illinois College of Medicine. Diagnosis was unequivocal in every patient, although the severity and symptomatology varied. All the patients had an enlarged thyroid gland and the characteristic cardiovascular manifestations of rapid bounding pulse and wide pulse pressure. All but one patient had eye signs, varying from separation of the eyelids to frank proptosis. Confirmation of the diagnosis had been obtained with radioiodine (I^{131}) uptakes since 1950 and in more recent years with determinations of serum protein-bound iodine. Elevated values of serum protein-bound iodine of 9 to more than 20 mcg. per 100 cc. were seen.

Either propylthiouracil or methimazole was used in treating these patients. The starting dose of propylthiouracil for young children should be 50 mg. every 8 hours. For adolescents it ranges up to 100 mg. every 8 hours. The dose of methimazole is about one-tenth that of propylthiouracil. The patients were kept in the hospital under mild sedation until improvement occurred—usually within 3 weeks. However, a completely euthyroid status was usually not achieved for 2 to 4 months. The subsequent assessment of the thyroid status was based on clinical appraisal, and the dosage was regulated accordingly. Occasionally, over 500 mg. of propylthiouracil had to be given daily to arrest thyroid activity. Maintenance treatment, with doses reduced to one-half or one-third, was continued for 6 months after the euthyroid status had been achieved to prevent recurrence. Three of the 11 patients in this series are still being treated with propylthiouracil. All are clinically euthyroid but require daily doses of 350 to 450 mg. of the drug to maintain remission. Their I^{131} uptakes 6 months prior to the time of writing, and after discontinuance of therapy for 1 month, were 57, 46, and 44% respectively. Some exophthalmos has persisted in the medically treated patients, but the thyroid gland has been considerably reduced in size.

If a child continues to have hyperthyroidism for more than one month despite attempts at medical control, surgery is advisable. Accordingly subtotal thyroidectomy was performed on 8 of the 11 patients in this series because of nodulation of the thyroid, toxic reactions to the antithyroid drugs, failure to maintain the euthyroid state on an outpatient basis, or inability to maintain adequate supervision of the patient after discharge from the hospital. Of the 8 patients operated on, 6 are now euthyroid; 1, however, has mild hyperthyroidism and 1 has recurrent toxic states and is currently receiving I^{131} therapy because of great emotional instability and failure to cooperate with medical management. A second operation was necessary in 2 patients because of recurrent thyroid nodules. A long-term follow-up of patients, even after subtotal thyroidectomy, is required. Surgical and medical opinions are divided about treatment of hyperthyroidism in children. The lack of extended patient series, the relative rarity of this disorder in children, and wide variations in follow-up practices at different clinics contribute to the existing differences in point of view.

Insulin-Producing Capacity of the Pancreas of Children with Diabetes Mellitus. R. Klein, J. Marks and I. A. Mirsky. Pediatrics 22:289-296 (Aug.) 195 [Springfield, Ill.].

The authors determined the response of concentration of sugar in the blood to the oral administration of 50 mg. per kilogram of body weight of tolbutamide and 2 Gm. per square meter of estimated body surface of indole-3-acetic acid in 12 children with diabetes mellitus and in children without evidence of metabolic disorder. These drugs are insulin-dependent hypoglycemic agents. Of the 120 children, 39 were studied during their initial hospitalization within 3 months after the diagnosis of diabetes mellitus had been made; 33 children had had clinical diabetes mellitus for 6 to 24 months, 23 had had it for 24 to 48 months, and 25 had had evident disease for 48 months or more. The administration of tolbutamide to nondiabetic children resulted in a decrease in the concentration of sugar in the blood to 56 ± 5.8% of the initial concentration within 30 minutes; the concentration of sugar increased slightly by the second hour and then remained at a hypoglycemic level for the next 3 hours. The nondiabetic children given indole-3-acetic acid did not show statistically significant changes in concentration of sugar in the blood. The administration of either tolbutamide or indole-3-acetic acid to the children whose metabolic derangement was discovered at or shortly before the time of admission resulted in a marked, statistically significant hypoglycemic response to about 70% of the initial concentration of sugar in the blood. A similar statistically significant decrease in the concentration of sugar in the blood was observed in the children with diabetes mellitus of 6 to 24 months' duration who were given indole-3-acetic acid. The children with diabetes mellitus of 24 or more months' duration showed less or no hypoglycemic response to the standard dose of either agent.

Since children with diabetes of recent origin do respond to these insulin-dependent hypoglycemic agents, it is postulated that the pancreas is capable of secreting insulin early in the course of diabetes in young persons. This ability is gradually and steadily lost, so that children with diabetes of over 2 years' duration are almost uniformly unresponsive to these 2 hypoglycemic agents. The data suggest that, after a variable period of clinically evident diabetes mellitus, the pancreas of the child becomes exhausted and incapable of secreting insulin.

Theoretical and Practical Questions on Chromosomal Sex Determination. E. Zdansky. Ann. paediat. 191:26-49 (July) 1958 (In German) [Basel, Switzerland].

Some investigators of chromosomal sex determination suggested that the sexual differences in the sex chromatin are caused by the differences in the size of the heterochromatic portions of the sex chromosome complexes of the nuclei of the somatic cells in females and males. Whereas the heterochromatic portions of 1 X-chromosome alone or of 1 X-chromosome and 1 Y-chromosome together are not large enough to be differentiable from the remainder of the chromatin, the female XX-complex is just large enough to be recognized as the "sex chromatin." Some observers cited as proof of this assertion the observation that the ovulum in the human ovary, which contains only 1 X-chromosome, has no sex chromatin but the surrounding follicular cells do have the sex chromatin. Considered from this viewpoint, the sex chromatin is really the conglobation of the heterochromatic compact portions of the 2 X-chromosomes of the cellular nucleus in the female organism. The male X-Y complex, which under normal conditions is too small to be differentiable from the remaining chromatin, becomes evident during chromatolysis. This fact must be considered during the practical evaluation of this sexual differentiation.

The author discusses various methods employed in chromosomal sex determination. At least 2 methods should be used to arrive at a reliable diagnosis of the genetic sex. The methods most easily employed in a clinic are the determination of chromosomal sex from the segment-nuclear leukocytes and from the epithelial cells of the buccal mucosa. The advantages of Feulgen staining over those of cresyl-violet staining are pointed out. Chromosomal sex determination is of particular importance in problems of intersexuality and in persons with deformities of the genitalia. The results obtained in persons with such abnormalities raised the question whether the sex chromatin is influenced by genetic, endocrine, or other factors. In this connection the author gives particular attention to the "drumstick" form of the sex chromatin in the leukocytes. If endocrine or other factors seem to exert an influence on the sex chromatin, they do this only indirectly by way of the nuclear morphology, because the influence becomes apparent only in the nuclei of the neutrophil leukocytes, not in the nuclei of the mucosal epithelium.

Meningeal Hemorrhages of Weak and Premature Infants: New Anatomicoclinical Investigations. P. Giraud, J. Espinas, J. Coignet and P. Decoppet. Semaine hôp. Paris 34:1817-1830 (June-July) 1958 (In French) [Paris].

Meningeal hemorrhage is a frequent cause of mortality during the first days of life in weak and premature infants. It was observed in 75 (15%) of 500 infants weighing less than 2,000 gm. (4½ lb.), who were admitted to the Centre Hospitalier for weak and premature infants at Marseilles, during the last 5 years. Meningeal hemorrhage was responsible for 51 of the 100 deaths due to known causes, and of the infants in whom this complication occurred, 70% died. Autopsy findings in 59 cases showed that meningeal hemorrhage is not caused by rupture of the large vessels or by lacerations of the dura mater but that it is the result of a slow escape of blood, often associated with edema of the central nervous system. The hemorrhage originates in the pia mater, the choroid plexuses, and the vessels of the ventricular walls. The mechanism producing this accident depends more on the degree of debility and prematurity than on obstetric trauma. The clinical signs of meningeal hemorrhage consist of respiratory disturbances, rather than of neurological disorders in the strict sense. Vasomotor disturbances, due to the inability of the vegetative system to perform its function because it is not yet fully developed, seem to be responsible for the edematous and hemorrhage-producing congestion of the nerve centers seen in the specimens. Prematurity itself, that is, the anatomic and functional underdevelopment of the nerve centers and the vegetative system, is apparently the cause of meningeal hemorrhage in the weak and premature infant. Other factors, such as trauma and anesthesia, may contribute to the fatal outcome, but the premature infant can be said in many instances to die because of the functional inadequacy of his nervous system.

Therapy should be based chiefly on careful reanimation, the administration of circulatory analeptics, coagulants, and, as adjuvants, nerve sedatives. Lumbar puncture and transfusions should be used with caution. Cortisonic remedies do not appear to have much effect on the course of the condition. Good nursing care, carried out by a well-trained nursing staff, is just as important as purely medical treatment. Preventive treatment of debility alone can diminish the frequency and severity of meningeal hemorrhage, which still contributes so extensively to infant mortality statistics during the first days of life.

A Major Clinical Entity in Pediatrics: Respiratory House-Dust Allergy. R. Mande, A. Herrault and C. Thérond. Semaine hôp. Paris 34:1843-1852 (June-July) 1958 (In French) [Paris].

Respiratory house-dust allergy, which is the most common form of respiratory allergy in the Paris region, may appear as rhinitis, rhinopharyngitis, recurrent tracheitis, bronchial asthma, or true asthma. The condition seems to be more prevalent in boys than in girls; out of 308 children with this form of allergy, 189 (61.3%) were boys. The age of the children at onset varies. Disturbances are not exceptional before the first year of life, and in 21% of the children of this series they began before the age of 6 months. Certain clinical signs, especially the appearance of the symptoms in the autumn and winter, should be sufficient to arouse suspicion of the allergic nature of the disturbance and should lead to tests with specific allergens. Intradermal tests are preferable to scarification, because they produce more distinct reactions. Examination should consist of thorough interrogation, clinical examination, a search for other allergic manifestations, especially cutaneous ones, a study of the eosinophil count, and examination of the nasal mucosa. Treatment does not consist in desensitization properly speaking, but rather in "mithridatism" or hyposensitization. This may be produced either by giving injections of gradually increasing doses of dust extract at short intervals, or by giving extremely weak doses of dust extract at longer intervals. The second method takes longer, but it is especially suitable for children, because it is gentle and flexible. Out of 154 children so treated, 133 were definitely improved (86.4%); 18 were moderately improved (11.7%); and in 3 (1.9%) the treatment did not seem to influence the allergy. Thus, satisfactory results were obtained in more than 80%. The success of the treatment was most striking in the seriously ill patients with permanent asthma or inveterate cough, most of whom were able to resume their normal activities and school attendance. The authors emphasize the fact that, except in limited and definite instances, all rhinopharyngeal surgical interventions, such as tonsillectomy and adenoidectomy, should be avoided in allergic children, because they lead to undesirable sequelae.

UROLOGY

Long-Term Treatment of Urogenital Tuberculosis with Triple-Drug (Aminosalyl + Streptomycin + Isoniazid). C. G. Hansson. Nord. med. 60:978-979 (July 10) 1958 (In Swedish) [Stockholm].

The advantages of treatment of urogenital tuberculosis with a combination of chemotherapeutics—PAS, streptomycin, and isoniazid—that are (1) lower doses of the preparations can be applied and toxic side-effects avoided, (2) a synergetic effect results, presumably because the preparations have different points of attack on the tubercle bacilli, and (3) the development of resistant strains can be delayed or possibly prevented by the combination of therapeutics. At Rävlanda Sanatorium triple-drug treatment was given for at least a year to 25 patients (17 men and 8 women) with urogenital tuberculosis. In all cases the urine reverted to normal. The average time from the start of treatment until reversion was 2.9 months; the average time from reversion until the last guinea-pig test was 18.2 months. No relapses occurred during this time. The average time of observation from ended treatment until the last guinea-pig test was 6.2 months. Earlier experiences showed that in cases with recurrence the relapse, as a rule, appeared during the first months after ended treatment. Because of the good results of triple-drug therapy at Rävlanda, nephrectomy is performed only in cases where there is marked reduction of function in one kidney because of extensive tuberculous changes. In 12 other patients (9 men and 3 women) given triple-drug therapy for a time, one of the preparations was withdrawn on account of side-effects; however, treatment was continued with the other preparations for at least a year, with good effect. In a few patients the triple-drug treatment was not carried out for a year, as tubercle bacilli continued to be found in the urine after 6 to 8 months' treatment, and another combination was applied.

INDUSTRIAL MEDICINE

Pneumoconiosis in Iron Miners: Chemical and Histological Study. R. Even and C. Sors. J. franç. méd. et chir. thorac. 12:374-387 (No. 4) 1958 (In French) [Paris].

A partial answer to the question whether the pneumoconiosis of iron miners is a siderosis, a silicosis, or a combination of these conditions has been obtained by the chemical and histological study of autopsy specimens in 12 personal unpublished cases of pneumoconiosis. The patients were miners who had worked exclusively in iron mines and who had been exposed to the danger of pneumoconiosis for from 19 to 31 years (average, 23 years). The disease was recognized, and the patients were indemnified from 1 to 7 years before death in 7 of the 12 cases; in the other 5, the diagnosis was established only after death. The level of free silica in the lungs, which is normally 50 mg. per 100 Gm. in a fresh specimen and 250 mg. per 100 Gm. in a dry specimen, was twice or three times that amount in 6 cases, 5 of which presented evidence of silicosiderosis. Ferric oxide was also greatly increased, usually to a level 14 or 15 times the normal, in all 12 cases.

Death was caused by right ventricular insufficiency in 7 patients, pulmonary tuberculosis in 1, ordinary bronchopneumonia in 1, prostatic cancer in 1, primary bronchial cancer in 2, and various conditions in 4. Right ventricular insufficiency was the cause of death in 5 of the 6 patients who had silicosiderosis and in 2 of the 6 who had siderosis. Sclerosis, emphysema, and siderosis were constant histological findings, in contrast to silicosis which was found in only half of the specimens. The case reports and the autopsy findings in these 12 patients, as presented in this article, thus show that, contrary to the optimistic views commonly held, the pneumoconiosis of iron miners usually progresses to death as a result of right ventricular insufficiency. It should therefore be regarded as an occupational disease entitling the patient to compensation.

Pneumoconiosis from Bagasse, Cement and Agave. E. W. Baader. Bol. Asoc. méd. Puerto Rico 50:171-180 (May) 1958 (In Spanish) [Santurce].

Inhalation of the dust of bagasse, cement, and agave fibers is a frequent cause of industrial pneumoconiosis. The symptoms of bagassosis may appear as early as 8 weeks after exposure of a person to the dust. They consist of acute bronchitis and atypical pneumonia, with fever, violent cough, and hemoptysis. The disease may be fulminant, may follow a natural course to recovery of the patient, with or without respiratory sequelae, or may follow a slow course for 3 or 4 years to a fatal outcome. The disease is believed by some to be an allergy; by others it is considered a reaction of the lungs either to a foreign body or to the salicylic acid contained in bagasse. The author believes that bagassosis is a mycosis caused by fungi and spores living in bagasse. He isolated 8 strains of organisms of the Aspergillus, Rhizopus, and other genera from bagasse. The pathological condition of the lungs of rats which had been subjected to inhalation of bagasse dust consisted of a chronic inflammation and a foreign body reaction. Although there is no specific treatment for bagassosis, prevention of the disease by means of apparatus to absorb the dust in sugar factories is of value.

Contact of cement dust with the skin may produce abscesses, ulceration, eczema, and other cutaneous lesions. Working in an environment pregnant with cement dust may cause conjunctivitis, inflammation and ulceration of the buccal and nasal mucosa, and even perforation of the nasal septum. Inhalation of cement dust may cause the formation of rhinoliths and inflammation of the mucosa of the upper respiratory tract. Cement pneumoconiosis is rare. Still more rare are the severe forms of the disease progressing to a fatal outcome. Pneumoconiosis caused by the dust from fibers of the agave is more frequent than it is believed to be according to the modern literature.

The Effect of Tractor Noise on the Auditory Sensitivity of Tractor Operators. D. M. Lierle and S. N. Reger. Ann. Otol. Rhin. & Laryng. 67:372-388 (June) 1958 [St. Louis].

Little is known about the effect of tractor noise on auditory sensitivity. During a practice of otolaryngology for the past several years in a rural area, the authors observed a number of farmers with dips at 4000 cps. In some instances the ear history and the physical examination were normal, except for the probability of tractor-noise-induced hearing loss. This paper presents the results of a two-part study of the effect of tractor noise on auditory sensitivity: the first part deals with the measurement of tractor noise; the second part is concerned with the results of pure tone threshold sensitivity measurements on 80 full-time tractor operators. The authors consider the results of this preliminary study as tentative until confirmed by other auditory measurements. They note the following points: 1. Tractor noise is sufficiently high in intensity to produce high-frequency hearing losses in tractor operators with noise susceptible ears if exposed over a period of several years. 2. The intensity of tractor noise can be reduced by more effective mufflers; the noise of certain tractor attachments also can be reduced by vibration control methods. 3. Dips in high-frequency perception are more common in patients between the ages of 30 and 60 years. 4. The absence of dips in older persons does not rule out the possibility of some noise-induced hearing loss. 5. Slightly greater losses occur in left than in right ears. 6. Individuals with noise susceptible ears usually experience tinnitus; such persons should wear ear plugs while operating tractors. 7. It is recommended that hearing surveys in the future be designed to test sensitivity at 500, 1000, 2000, 3000, 4000, and 8000 cps in order to obtain more information about the frequency-intensity characteristics of dips and to learn more about the aging ear.

THERAPEUTICS

The Liberation of Morphine from Codeine in Man and Dog. P. Pærregaard. Acta pharmacol. et toxicol. 14:394-399 (No. 4) 1958 (In English) [Copenhagen].

In an attempt to answer the question whether the analgesic action of monomethyl-morphine (codeine) is due entirely or in part to conversion into morphine, experiments were carried out on 6 human volunteers and on 3 dogs. The human volunteers were given 50 mg. of codeine phosphate orally, and urine was thereafter collected over 8-hour periods. Each of the dogs was given doses of 2, 20, and 40 mg. of a preparation containing 5% codeine per kilogram of body weight in 3 successive experiments; the drug was given subcutaneously in 2 experiments and orally in 1. Urine specimens were collected for 24 hours in 2 amounts—an 8-hour fraction and a 16-hour fraction. Each urine specimen was analyzed for morphine, 1 portion before and 1 portion after hydrolysis, in order to determine both free and total morphine. About 4% of the administered amount of codeine was excreted as morphine in the urine of the human volunteers. This corresponds to a conversion into morphine of about 10% of the codeine. No measurable amounts of free morphine were found in the urine. In the dogs, about 2% of the codeine was demethylated to morphine. After the administration of the largest doses of codeine, 2 to 4% of the morphine excreted was in the free form. These findings suggest that the pharmacological action of codeine is due, at least in part, to the morphine produced. There is much evidence to suggest that the effect of the resulting morphine is considerably less than that of the same amount of morphine injected as such into the organism.

Clinical Experiences with Orisul, a Long-acting Sulfonamide Preparation. A. F. Essellier, H. Hunziker and R. Goldsand. Schweiz. med. Wchnschr. 88:813-817 (Aug. 16) 1958 (In German) [Switzerland].

The authors report on 73 patients with diseases of the genitourinary tract, 37 patients with diseases of the respiratory tract, 3 patients with diseases of the bile ducts, and 7 patients with miscellaneous conditions who were admitted to the medical clinic of the University in Zurich, Switzerland, and were treated with Orisul [3-(*p*-amino-benzolsulfonamido)-2-phenyl-pyrazol]. As a rule, the patients were given orally 1.5 Gm. of the drug per day; a few seriously ill patients were given 1.5 Gm. twice a day at intervals of 12 hours. Unconscious patients or those with a preceding intestinal disturbance were given 0.5 to 1 Gm. of the drug intramuscularly every 12 hours. The success of the therapy was evaluated according to the following criteria: restoration of temperature to normal, improvement in local findings, decreased erythrocyte sedimentation rate, and generally improved condition. The absorption, excretion, and tolerance of the drug were studied in an additional 54 patients.

Maximal concentration of Orisul in the blood was obtained within 3 or 4 hours after the oral administration of a single dose of 1.5 Gm., and after 44 hours the blood level was still 1.5 mg. per 100 cc. The degree of acetylation proved to be small, 10 to 15% appearing in the blood in the acetylated form. Orisul proved to be clinically effective in infections caused by streptococci, enterococci, pneumococci, staphylococci, Escherichia coli, and Proteus organisms. Of the 73 patients with genitourinary disturbances, 59 had chronic cystitis, 7 acute cystitis, and 7 acute cystopyelitis. Thirty-six of the patients with chronic cystitis, 4 of those with acute cystitis, and 4 of those with acute cystopyelitis were clinically cured. Of the 37 patients with diseases of the respiratory tract, 10 had bronchopneumonia, 3 had peribronchiectatic pneumonia, 9 had emphysematous bronchitis, 6 had pneumonia associated with influenza, and 7 had various pulmonary conditions. Good results were obtained with Orisul in 5 patients with bronchopneumonia, in 2 with peribronchiectatic pneumonia, in 5 with emphysematous bronchitis, and in 5 with pneumonia resulting from influenza. Temperature was restored to normal by crisis within 1 or 2 days. One patient with chronic cholecystitis and 2 patients with cholangitis made a complete recovery. Orisul proved to be effective in 3 patients with acute tonsillitis and furunculosis and in 2 patients to whom it was given prophylactically to prevent infection in the course of corticosteroid therapy. It was also clinically effective in many patients in whom the causative agents were found to be resistant in vitro to other sulfonamide preparations or to antibiotics and in whom treatment with these other drugs had been ineffective. Undesirable side-effects, such as nausea, formation of Heinz bodies, and allergic cutaneous reactions, were rare.

Use of Sulfonylurea Compounds for Treatment of Diabetes Mellitus. J. R. Hofstetter and C. Ramel. Schweiz. med. Wchnschr. 88:821-827 (Aug. 23) 1958 (In French) [Basel, Switzerland].

The authors report on 160 patients with diabetes mellitus who were given ambulatory treatment with the sulfonylurea compounds, carbutamide (BZ 55) and tolbutamide (D 860). Of the 160 patients, 152 were more than 40 years of age and 8 were less than 40. Treatment was effective in 136 patients, and 24 patients were failures. Six (75%) of the 8 patients, aged less than 40 years, were failures. Of 43 patients over 70 years of age, 1 (2.5%) was a failure. The ratio of failures thus diminished with age. The older the patients the better they responded to the treatment.

Of the 24 patients in whom the treatment failed, the duration of the disease was less than 6 months in 1 and more than 5 years in 14; thus, there were more failures among the patients with diabetes of longer duration. There were more failures also among those requiring high doses of insulin, but 6 of 14 patients requiring more than 40 units of insulin responded satisfactorily to the treatment with sulfonylurea compounds alone. The duration of previous treatment with insulin did not seem to be of great importance. Juvenile patients with diabetes mellitus and those with hemochromatosis did not, as a rule, respond to the treatment with sulfonylurea compounds. Although late failures have been reported by other workers, they were not observed by the authors. In contrast to other workers who have been able to decrease the amount of insulin administered by combining it with sulfonylurea compounds, especially in young and in hospitalized patients, the authors were not able to obtain favorable results by such a combined treatment in their ambulatory patients.

Intolerance for carbutamide was observed in 13 patients and intolerance for tolbutamide in 2; these observations confirmed those by other workers that, in general, the tolerance for tolbutamide is better than that for carbutamide. Occasionally it was possible to overcome sensitization to the drug by a progressive increase of very small doses (desensitization). Hypoglycemia, as a rule, is rare, but 1 case of severe hypoglycemia resulting in death was observed in a 63-year-old woman with adrenal cortical hypofunction (Addison's disease), who was given 3 tablets of carbutamide daily in an attempt to stimulate the patient's appetite. A definite increase in body weight, continuing for some weeks in the course of the treatment with carbutamide, was observed in several patients. The effects of carbutamide and tolbutamide were compared in 48 patients who first were treated with carbutamide and then with tolbutamide; in 34 of the 48 patients the 2 compounds were equally effective, but in the remaining 14 tolbutamide was inferior to carbutamide. Eight of the 160 patients had cirrhosis of the liver, and this complication was not influenced by treatment with the sulfonylurea compounds; these drugs did not seem to exert an effect on the vascular and infectious complications of diabetes mellitus. Carbutamide has more secondary effects than tolbutamide, but it is also more active than that drug.

Clinical Cure of Buerger's Disease with a New Treatment: Malarial Therapy. F. Corelli. Minerva med. 49:2685-2696 (July 7) 1958 (In Italian) [Turin, Italy].

During the past 17 years the author has treated 32 patients with thromboangiitis obliterans (Buerger's disease) by the intravenous administration of 30 to 50 cc. of homologous blood obtained from patients with tertian malaria during the episodes of chills. Malaria was thus induced without the incubation period, and the disease began its clinical course a few hours after the injection. First, the temperature rose from 39 C (102.2 F) to 40 C (104.0 F), accompanied by leukopenia and splenomegaly. The temperature remained constant for the first 2 to 4 days of the incidence of malaria and was followed by the typical chills of tertian malaria. Buerger's disease was clinically cured after 7 or 8 chills in a period of 10 to 15 days. The induced malaria was then cured with chloroquine, administered by the oral or the intramuscular route, within 24 hours. The general health of the patients improved remarkably a few days after they became afebrile, and no complications attributed to malarial infection developed in them. However, smoking or inhalation of the air of smoke-filled rooms proved harmful, and elimination of all contact with smoking was considered essential.

Treatment of Buerger's disease with malarial therapy can have adverse effects in patients who are simultaneously treated with either cortisone or corticotropin (ACTH). This therapy may also be harmful for patients who have undergone unilateral adrenalectomy and is contraindicated for those who have undergone bilateral adrenalectomy. The author believes that the therapeutic effect of malarial therapy for Buerger's disease is based not merely on its antipyretic properties but that this is an instance of a disease cured by induction of another disease. Malaria as a "second" disease produces systemic anti-inflammatory, analgesic, and resolvent actions.

PATHOLOGY

Studies on Division Inhibition and Filament Formation of Escherichia Coli by Ultraviolet Light. R. A. Deering. J. Bact. 76:123-130 (Aug.) 1958 [Baltimore].

The author carried out quantitative microscopic studies for determining the effect of monochromatic ultraviolet radiation on the cellular division of Escherichia coli, strain B. It was found that the division inhibition, or, more accurately, extended delay, which is produced in Esch. coli by relatively low doses of monochromatic ultraviolet radiation, is rather specific in that division stops, while total mass, ribonucleic acid, and deoxyribonucleic acid synthesis continue at nearly the same rate as for dividing cells. The nondividing cells continue to increase in length, and long filamentous cells result. The curves in which survival and retention of ability to divide are plotted against dosage of ultraviolet radiation indicate that a single hit disorganizes an entire cell. The 37% survival dose is 3 ergs per square millimeter at 2652 A ultraviolet radiation. Many of these filaments recover the ability to divide at some later time and form normal-appearing macroscopic colonies. The ultraviolet action spectrum for division inhibition suggests nucleic acid as the ultraviolet absorbing cell component active in initiating the extended delay. The division inhibition can be partially reversed by irradiation with visible light if given within 20 minutes after the completion of the dose of ultraviolet irradiation. The filaments appear to be single cells with many "nuclear bodies" and not segmented structures or chains of cells.

Metastasis of Cancer to Cancer. I. Gore and R. Barr. A. M. A. Arch. Path. 66:293-298 (Sept.) 1958 [Chicago].

Metastasis of cancer to cancer is an exceedingly rare event, considering the frequency of neoplastic disease and the not uncommon occurrence of multiple malignancies. Two such cases are reported in which widespread carcinomas, originating in breast and prostate, respectively, formed secondary deposits in localized nephromas. In view of the fact that the success or failure of secondary tumor growth is dependent upon competition with the host tumor for essential nutrients, and in view of the smaller nutritive requirements of the localized hypernephroid tumors, it is not surprising that such tumors are the recipient neoplasms in more than two-thirds of the cases inasmuch as they are one of the less frequent forms of cancer. The rarity of metastasis to cancer and the fact that the supply of nutrients is more often than not inadequate for the simultaneous growth of 2 malignant neoplasms are compatible with the tenet that the localized hypernephroid growths are dormant growths and have not as yet attained the degree of anaerobic metabolism characteristic of full-grown malignant neoplasms.

Yeast Antibiotic with Therapeutic and Prophylactic Properties. I. A. Parfentjev. J. Infect. Dis. 103:1-5 (July-Aug.) 1958 [Chicago].

The author isolated from alkaline aqueous extracts of brewer's and baker's yeast a fraction containing a protein possessing anti-infectious properties. This new agent was called Malucidin. It differs from other antibiotics in that it has a much broader spectrum of action and produces a longer lasting effect. The new antibiotic is readily soluble in water in a wide range of pH, has an isoelectric point near pH 2, and is not dialyzable. It can be precipitated in 50% ammonium sulfate and also by the addition of an equal volume of acetone; it can be precipitated easily at neutrality by 0.05 M calcium chloride or by only 0.005 M cadmium chloride. Chemotherapeutic experiments with this agent showed solid protection of mice, guinea pigs, rabbits, and pigeons against many species of gram-negative and gram-positive bacteria. Malucidin also protected mice against systemic infection with Candida albicans and against Shigella endotoxin. Peritoneal injections of Malucidin in mice induced resistance to infections with Proteus organisms which lasted one month.

Symptomatology and Pathology of Pulmonary Adenomatosis. P. Weicksel and H. Cain. Ztschr. klin. Med. 155:310-328 (No. 3) 1958 (In German) [Berlin].

The authors report on 4 women, aged 43, 54, 39, and 61 years, respectively, with pulmonary adenomatosis, on whom autopsies were performed after death. Tumors of adenomatous type in the lung may be classified in 3 basic groups: (1) those occurring in the course of diffuse, progressive, interstitial pulmonary fibrosis and cirrhosis (so-called pseudoadenomas); (2) those of congenital origin; and (3) genuine primary pulmonary tumors (pulmonary adenomatosis in the proper and narrower sense). All 4 patients had tumors of the third type. The first symptoms of the disease were refractory irritative cough and pain at the side of the involved lung. The occurrence of copious, mucous, watery-clear sputum was manifested almost simultaneously with increasing dyspnea. When pulmonary insufficiency became manifest, it dominated the clinical picture until the patient died. The primary cause of this pulmonary insufficiency is a disturbance of ventilation, since the alveoli are filled with mucus and their walls are lined with mucus-forming, high cylindrical cells. But there may also occur a disturbance due to spread and manifested by considerable reduction of the respiratory limiting values. A malignant behavior of the tumor was observed from the onset in the 39-year-old patient, with rapid destruction of parenchyma, vascular involvement, and metastases; connective tissue thickening of the interalveolar septal structures was associated with considerable restriction of the capillary surface. Prolonged duration of such changes may cause dilatation of the right heart, as it occurred in this patient, and chronic cor pulmonale may result later.

Autopsy findings showed macroscopically 2 forms of adenomatosis, i. e., focal-nodular adenomatosis and diffuse adenomatosis reminding one of lobar pneumonia. The latter form probably originates from the first by secondary spread. Microscopic findings also revealed 2 forms of adenomatosis. The cell picture of the first form was that of a completely uniform, highly differentiated adenoma which hardly had the appearance of a malignant tumor. There was no involvement of blood and lymph vessels. The pulmonary structure was preserved. Aerogenic spread to several lobes may cause respiratory insufficiency and cardiovascular decompensation, and this course is responsible for the unfavorable prognosis. The cell picture of the second form did not differ in principle from that of mucus-forming adenocarcinoma. Destruction of parenchyma resulted from perforation of the alveolar wall and infiltration of the interstitial spaces, with severe connective tissue reactions. The course of this form of the disease is rapid. An alveolar origin of the adenomatosis with an onset in a circumscribed area was assumed in all 4 patients. In contrast to Eck's concept, adenomatosis should be considered as a primary tumor-forming disease of the lung and should be differentiated from bronchial carcinoma and from secondary carcinomatous pneumonia.

RADIOLOGY

A Study of Radiation Therapy in Carcinoma of the Pancreas. J. S. Billingsley, L. G. Bartholomew and D. S. Childs. Proc. Staff Meet. Mayo Clin. 33:426-430 (Aug. 30) 1958 [Rochester, Minn.].

The diagnosis of carcinoma of the pancreatic exocrine parenchyma was established histologically in 64 cases at the Mayo Clinic in 1953. Twelve of the 64 patients are excluded from this study inasmuch as they underwent radical excision. Of the remaining 52 patients, 29 were treated with some sort of palliative operation (choledochoduodenostomy, gastroenterostomy, etc.), while 20 underwent no surgical procedure other than biopsy. Six of the surgical group received postoperative radiation therapy, as did 7 of the biopsy group. All but 1 of the 13 patients were treated with a radiocobalt (Co^{60}) teletherapy unit, the one exception being treated with a conventional 250-kv. x-ray machine. The average tumor dose was 3000 r given over an average of 19 treatment days. The authors do not consider the slight differences in the survival figures between the irradiated and the nonirradiated groups as significant. Moreover, they do not consider that radiation therapy in the doses given in this series offers the patients any appreciable chance of longevity. A review of the individual case histories in an effort to discern the presence of some of the less tangible potential benefits of radiation, such as relief of pain or retardation of the formation of fluid, was equally discouraging. The authors conclude that radiation therapy in the doses given in this series is of little or no value as a palliative measure in cases of carcinoma of the pancreas.

Tuberculomas: Criteria for Roentgenographic Differential Diagnosis. L. Oliva and G. Secondo. Minerva med. 49:2431-2440 (June 20) 1958 (In Italian) [Turin, Italy].

The authors found that, in considering roentgenologic criteria alone, stratigraphy according to the technique of Vallebona is the most useful procedure for differentiating a tuberculoma from peripheral pulmonary tumors and from other round-shaped intrapulmonary lesions. Round-shaped shadows with clear borders and with a diameter not exceeding 2 cm. indicate a tuberculoma. Other shadows with irregular and trimmed borders, as if they were caused by abrasion, cannot be related to a tuberculoma. Round-shaped, opaque shadows made of concentric layers are characteristic of a tuberculoma of the Lachman-Uehlinger type. Dense and homogeneous opacities denote a tuberculoma; nonhomogeneous opacities denote neoplastic lesions. Calcifications with nuclei located in the middle and those made of concentric layers reveal a tuberculoma. Multiple hollows in the shadow of a tuberculoma have an oblong shape and are mostly located along the periphery; multiple hollows in the shadow of a malignant tumor have various shapes and irregular disposition. Large lymph-node-like masses which compress and displace the trachea and the bronchi represent metastases of the lymph nodes. Shadows which are stationary or retrogressive in size indicate a tuberculoma, whereas shadows of a malignant tumor are erratic and do not show a uniform increase in size. The preceding observations are helpful, but they are not unequivocal indications for making a roentgenographic differential diagnosis of tuberculoma. Roentgenologic interpretations must be complemented with the clinical and laboratory findings.

PUBLIC HEALTH

Unusually High Incidence of Appendicitis Cases at Dohad Town in Panch Mahals District in Bombay State: Preliminary Communication. T. B. Patel and V. N. Rao. Indian J. M. Sc. 12:517-520 (July) 1958 (In English) [Bombay, India].

Between March and December, 1957, 64 cases of "appendicitis" were detected in 30 male and 34 female patients, all of whom except 1 were Banias and all except 2 were residing in 2 areas adjacent to the main tank in Dohad Town in Panch Mahals District in Bombay State, India. Most of the patients were between the ages of 10 and 35 years. Only 5 patients had a typical acute attack of appendicitis, with acute pain in the right iliac fossa, tenderness at McBurney's point, fever, and vomiting. In the other patients the pain was of a more chronic and general type, either being all over the abdomen or being in the right hypochondrium or epigastrium in the beginning and then later localized to the right iliac fossa. Pain was associated with fever in 18 patients and with vomiting in 23. In 56 patients the pain was of a very mild nature and became severe only before they were operated on for "appendicitis." Two of these patients died shortly after the operation; a gangrenous appendix had been found at operation in one, and the other patient was considered by the surgeon to have typhoid.

The acute onset of symptoms, with fever, pain, and vomiting, suggested an infective process. The fact that nearly all the cases occurred in the Bania community suggested a common source of infection. It was noticed that the Banias were mostly using water from the adjacent tank for washing, bathing, and sometimes cooking purposes, in addition to using water from wells located close to the tank. The tank water showed heavy pollution on bacteriological and chemical analysis. Stool examination showed that only 1 of 46 specimens was positive for Entamoeba histolytica. Fifteen blood specimens were obtained from patients operated on and were subjected to serologic examination; by slide agglutination a significant number were found to be positive for Salmonella enteritidis, Sal. typhimurium, and Sal. choleraesuis, and many specimens showed multiple infection. On examination of 13 additional serums, it was found that a significantly high proportion of the specimens obtained from those who had undergone surgery and those who had not gave positive results by tube agglutination for Shigella sonnei, Sh. flexneri, and Sh. shigae. The occurrence of cases of "appendicitis" in such large number as was revealed by this study appeared to be the outcome of a multiple Shigella-Salmonella infection, a finding which seemed to be unique in the literature.

An Epidemic of Shigella Sonnei Dysentery Arising in a General Hospital. N. J. Ehrenkranz, M. J. Takos, W. R. Hoffert and F. Reimer. New England J. Med. 259:375-377 (Aug. 21) 1958 [Boston].

In a 5-day period in July, 1957, there was an explosive outbreak of gastroenteritis involving approximately 80 persons, the majority of whom were employees of the Jackson Memorial Hospital in Miami, Fla. Eleven were patients previously hospitalized for another illness; the rest were nurses, physicians, surgeons, medical students, and clerical employees. The onset of symptoms was gradual, with headache, anorexia, and malaise preceding abdominal cramps and blood-streaked diarrhea by 8 to 12 hours. Maximum temperature in the hospitalized patients was 103.4 F by mouth; maximum duration of fever was 8 days; and total duration of diarrhea was 10 days. Microscopic examination of feces revealed many red and white blood cells. Cultures of stool and rectal-swab specimens revealed the presence of Shigella sonnei in 37 patients. One of the 2 food handlers in the cafeteria responsible for the contaminated food was disclosed to be a carrier of Sh. sonnei. Epidemiologic evidence pointed to a food-borne outbreak, with turkey salad as the vehicle, since stool cultures from 61 asymptomatic persons, who had eaten in the cafeteria on the suspect dates but who had not eaten the turkey salad, did not reveal Shigella organisms.

On the Control of Antibiotic Discs in Canada. L. Greenberg and K. M. Fitzpatrick. Canad. M. A. J. 79:383-386 (Sept. 1) 1958 [Toronto].

Improperly made and improperly labeled antibiotic disks present a serious health hazard in that a disk labeled to contain 10 units of antibiotic but, in fact, containing only 1 unit, if used in testing the sensitivity of an organism isolated from an infectious process in a patient, could give rise to misleading results which might deny the patient the use of a lifesaving drug. If the same disk labeled as containing 10 units actually contained 30 or more units, false-positive results would be forthcoming, and the patient would then be given a preparation that would have little or no therapeutic value. In a survey of antibiotic disks distributed in Canada, it was found that in many instances there was little correlation between the labeled claims and the assayed potency. The differences were extreme, with disks with no trace of antibiotic present and others with potencies varying from 1/10th to 3 or 4 times that declared on the label.

During the period under review, 640 lots of antibiotic disks, representing products from 4 manufacturers, were received and assayed at the Laboratory of Hygiene. A total of 1,186 individual components were assayed by the extraction technique, and, in addition, a number were subjected to performance tests. The results of assays of antibiotic sensitivity disks entering Canada between March, 1957, and June, 1958, revealed that in 3 companies more than 84% of the antibiotic disks received were acceptable; that in 2 companies more than 83% of the sulfonamides, etc., were acceptable; that in 2 companies 71 and 52% of the multiple antibiotic disks assayed were acceptable; and that in 1 company 75% of the individual components and 87% of the multiple sulfonamides were acceptable. Two companies showed marked improvement during the assay period, the rejection rate for company A dropping from 15% to zero and that for company C dropping from 75% in the first 6 months to 15% in the last 6 months. It is of note that most of the manufacturers rely almost exclusively on the use of performance tests for controlling their products, the result of which was a high proportion of faulty lots. For this same reason the authors developed the present assay method utilizing an extraction technique. The control program is to continue, and more effective regulations are being considered.

BOOK REVIEWS

Variables Related to Human Breast Cancer. By V. Elving Anderson, Harold O. Goodman, and Sheldon C. Reed. Study from Dight Institute of Human Genetics. Cloth. $4. Pp. 172, with 7 illustrations. University of Minnesota Press, Minneapolis 14, 1958.

This book presents a careful statistical analysis of the incidence of cancer of the breast in close female relatives of patients with this disease. The material studied is taken from the tumor clinic of the University of Minnesota Hospitals. The authors call attention to the fact that this source introduces ethnic, economic, and residential factors of selection. The corresponding relatives of husbands are used as controls. This has a tendency to minimize environmental differences. The follow-up is excellent. An effort is made to evaluate genetic factors, and the limitations of the method are described. The findings of prior studies that mothers, sisters, and daughters of breast cancer patients have a higher incidence of the disease than is found in the controls and in the general population is confirmed. To the extent possible, the results of this study are compared with those of other reported series. The pitfalls of statistical conclusions are delineated, and certain courses of future research are indicated. The paucity of clinical material limits the value of the book for those who are concerned only with clinical medicine. This is a careful and conservative presentation which should be valuable to those whose range of interest includes statistical studies and the epidemiology of cancer of the breast.

Orr's Operations of General Surgery. By George A. Higgins, M.D., F.A.C.S., Associate Professor of Surgery, University of Kansas School of Medicine, Kansas City, and Thomas G. Orr, Jr., M.D., F.A.C.S., Associate in Surgery, University of Kansas School of Medicine. Third edition. Cloth. $20. Pp. 1016, with 835 illustrations. W. B. Saunders Company, 218 W. Washington Square, Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

This edition was begun by Orr, the original author, but the task was interrupted by his sudden death and the two present authors completed the task. The book must be objectively evaluated on the basis of a work purportedly to be of value at this time. The volume is well bound and profusely illustrated, and the type is large and easily read. It is, however, difficult to recommend it as a textbook on operative surgery. A number of rather curious features are presented. For example, on page 38 there is a description entitled "Technique of Fillet of Finger," an operation in which the normal skeletal structures of the fifth digit are electively excised to afford a soft tissue tube that can be opened and used as a flat flap to cover a defect on the lateral aspect of the hand, but several pages later flap formations from the chest or abdominal walls to accomplish the same purpose without elective sacrifice of a digit are described. No discussion of the advantages or disadvantages of either method is presented. A technique of lower extremity amputation by transection through the neck of the femur and ascribed to G. M. Huggins with a 1918 reference appears in the chapters on amputations. A rather involved description of orderly surgical tracheostomy is given, in contrast to emergency tracheostomy with no discussion of the relationships of the former to other major procedures in the neck and no correlation with radical cervical lymphadenectomy.

On page 248, the technique of closed thoracostomy is described in which it is recommended that the preferable site of introduction of the catheter is in the second or third intercostal space in the midclavicular line. For simple mastectomy, elliptical incisions with removal of much skin is depicted—a procedure described as closely approaching radical mastectomy—while no mention is made of the transverse incision and preservation of skin for cosmetic purposes. In the discussions of extended radical mastectomy, the internal mammary nodes are considered but no mention is made of possible concomitant supraclavicular node dissection. The descriptions for operations on the alimentary tract include nothing that could not have been just as well stated years ago. One comment is unavoidable in this connection, and that applies to what is said about the technique of appendicial abscess drainage: "If the abscess lies away from the abdominal wall, the free peritoneal cavity may be opened. A gauze pack placed down to the abscess, to be removed in five or six days, will form a channel for exit of pus without contaminating the peritoneum." A cardinal principle in the drainage of periappendical abscesses is their immediate evacuation via a route that avoids peritoneal cavity exposure from the outset. The chapters on the somatic and sympathetic nervous systems are concise and well written from the standpoint of a general surgeon who may be called on to perform certain procedures when a neurosurgeon is not available. In the chapter on the endocrine system, a subject rather superficially dealt with, not enough attention is devoted to the anterior transperitoneal approach to the adrenals. The operations on the

---

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

genitourinary system are incompletely and very sketchily dealt with, and the same may be said for the chapter on gynecology. The operation for construction of an ileal bladder is described in detail, yet nothing is said about pelvic exenteration, a part for which the ileal bladder procedure was originally revived in its modern form. While the book contains many good illustrations, most of these are not original but are redrawn or reproduced from other works. After chapters dealing with various categories of regional surgery, there are brief bibliographies, but these are far from comprehensive and the most important references are not necessarily cited.

Roentgenology of the Chest. Edited by Coleman B. Rabin, M.D., F.C.C.P., Assistant Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University, New York. Editorial Committee: Benjamin M. Gasul and others. Sponsored by American College of Chest Physicians. Cloth. $19.50. Pp. 484, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book represents a bilateral approach to the subject of diseases of the chest, intertwining the clinical aspects with the roentgenographic findings. The objective of the authors is to present roentgenology of the chest to the roentgenologist from the clinical standpoint and to the clinician from the radiologic point of view. This has been accomplished admirably. To effect this objective 50 experts (roentgenologists and clinicians) have contributed 39 chapters. Each chapter presents a masterful exposition of a particular phase of the general subject. The book covers diseases and abnormalities of the thoracic wall and its contents, including circulatory disturbances, heart and great vessels, pulmonary circulation, and the diaphragm. Greatly enhancing the value of the presentation are chapters devoted to such subjects as the possibilities and limitations of x-ray diagnosis, normal roentgenographic appearances, mass fluorography, methods of x-ray examination, and special signs in chest roentgenography. To detect and identify the abnormal, a thorough knowledge of the normal is essential. The subject matter is beautifully illustrated with excellent reproductions of roentgenograms. A bibliography is at the end of each chapter, in some instances not too extensive but adequate, and an excellent subject index and index of authors is provided. The contributors have presented the subject matter in a clear, concise, but comprehensive manner. The editor, editorial committee, contributors, and the publishers deserve commendation for producing such a comprehensive and excellent compilation. This book is highly recommended to any physician interested in chest disease. Certainly roentgenologists, chest physicians, and thoracic surgeons should not fail to add it to their library.

A Synopsis of Surgical Anatomy. By Alexander Lee McGregor, M.Ch., F.R.C.S. With foreword by Sir Harold J. Stiles, K.B.E., F.R.C.S. Eighth edition. Cloth. $7. Pp. 808, with 766 illustrations by Dr. E. A. Thomas. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; John Wright & Sons, Ltd., 42-44, Triangle West, Bristol 8, England, 1957.

This reference book, which first appeared in 1932, is now in its eighth edition. Such a reception is a commendation in itself. With each edition refinements and new material have been added. This one contains new sections dealing with adrenalectomy, injuries to the large lymph ducts, and paragangliomas. A feature of particular value to the busy surgeon is the manner of presentation of anatomic facts. The contents of the book are presented as separate essays, any one of which is complete in itself. This book is not meant as a classical textbook of anatomy. The author has focussed his attention on anatomic facts, of practical value, to the student and the physician in practice. He has achieved his purpose by correlation and contrast of the pertinent facts. The discussion of the lymphatic system and its role is praiseworthy. With the necessity of removal of lymph nodes, when performing operations for cancer, the value of such a well-documented analysis of this system becomes more evident. The illustrations and the carefully worded legends are well placed, lucid, succinct, and accurate. The format is attractive. The author has a charming manner of expression which adds to the pleasure of reading. This book, which has been a hallmark of anatomy textbooks for the surgeon for many years, excels the previous editions. It is a welcome addition to the list of necessary books for the student, the surgeon, and all teachers of surgery.

Cardiovascular Diseases. By David Scherf, M.D., F.A.C.P., Professor of Clinical Medicine, New York Medical College, Flower and Fifth Avenue Hospitals, New York, and Linn J. Boyd, M.D., F.A.C.P., Professor and Director of Medicine, New York Medical College, Flower and Fifth Avenue Hospitals. Third edition. Cloth. $17.75, Pp. 829, and 119 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W. C. 1, England, 1958.

Almost 10 years have elapsed since the previous American and British editions of this book were published, although several editions have appeared in a number of foreign languages. This third English-language edition is completely revised, and many new sections have been added. An excellent bibliography follows each chapter and suggests pertinent references and appropriate articles up to March, 1957. The entire field of cardiovascular diseases is covered, and special emphasis is given to the clinical manifestations of disease. The history and physical examination, rather than instrumental and laboratory methods, are stressed, and signs and symptoms are discussed from anatomic, physiological, and pathological viewpoints. The book is filled with pertinent observations and findings which have been gathered through years of wide experience by competent teachers. Therapeutic procedures for special conditions are discussed in a realistic manner throughout the book, but the last chapter deals more completely with agents that are helpful in the management of cardiac failure. Electrocardiography is discussed only briefly, because the authors have published a companion book on clinical electrocardiography. This excellent book should be useful to all students of medicine regardless of their training.

Functional Bracing of the Upper Extremities. Written and illustrated by Miles H. Anderson, Ed.D., Director, Prosthetics Education Project, School of Medicine, University of California, Los Angeles. Edited by Raymond E. Sollars, Associate Director, Prosthetics Education Project. Cloth. $9.50. Pp. 463, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This is the first book on techniques of making and fitting functional braces for patients with paralytic disabilities of the upper extremities. The braces utilize power or force from springs, rubber bands, or functioning muscles to provide basic movements lost by paralytic disorders. This extensive work is devoted primarily to concise descriptions, with profuse use of photographs of the step-by-step fabrication of functional supports and devices that have proved reasonably successful. The author has indicated the basic devices available commercially to kit form. There are chapters devoted to the functional anatomy of the hand, upper extremities, and shoulder girdle, as well as chapters on the principles of biomechanics of functional bracing. Functional bracing is a relatively new concept to many physicians, as well as orthotists, and this book is an excellent "first" in the field. It should be a useful reference to physicians, particularly physiatrists, orthopedists, and neurologists, who are concerned with poliomyelitis and other paralytic conditions involving the upper extremities. Orthotists and others who make the devices should find this book a valuable part of their library. Occupational and physical therapists should have ready access to this volume.

Theory of Psychoanalytic Technique. By Karl Menninger, M.D. Menninger Clinic monograph series no. 12. Cloth $4.75. Pp. 206, with 15 illustrations. Basic Books, Inc., 59 Fourth Ave., New York 3, 1958.

The author is one of the foremost psychoanalysts in the United States and one of the first trained here, but he has never ceased to be a physician, psychiatrist, and teacher. In fact, his extensive creativity has expressed itself in countless ways, including developing a gigantic training center at Topeka, Kansas. He is, therefore, well qualified for the authorship of an authentic book on psychoanalytic technique, which he presents in an undogmatic, easily understood way with illustrations and cogent extractions from the literature. An instructive bibliography and an adequate index are included. The book is highly recommended not alone for student analysts but for all psychiatrists interested in psychodynamic psychotherapy.

Atrial Arrhythmias, Digitalis and Potassium. By Bernard Lown, M.D., Research Associate in Medicine, Department of Nutrition, Harvard School of Public Health, Boston, and Harold D. Levine, M.D., Assistant Clinical Professor of Medicine, Harvard Medical School, Boston. Cloth. $6.90. Pp. 222, with 53 illustrations. Landsberger Medical Books, Inc., 51 E. 42nd St., New York, 1958.

This monograph is concerned with the analysis of 64 cases of paroxysmal atrial tachycardia with atrioventricular block caused by digitalis intoxication. The authors point out that this manifestation of digitalis toxicity has been increasing in incidence in the past few years as patients with congestive heart failure are treated vigorously with such drugs as mercurial diuretics which may cause cellular potassium depletion. Treatment for this condition is to stop digitalis and diuretic administration temporarily and give the patient potassium. The use of a chelating agent, such as sodium ethylenediaminetetraacetate, to induce hypocalcemia is also advocated in certain cases. The relationship of the potassium and calcium ions to digitalis dosage and toxicity is discussed at some length, as well as the clinical and electrocardiographic differentiation from other arrhythmias. The book is well illustrated, and the text is well written and easy to read. It is recommended for internists and cardiologists.

Hospital Planning for the Anesthesiologist. By William H. L. Dornette, M.D., Professor of Anesthesiology and Head of Department, University of Tennessee College of Medicine, Memphis. Publication number 335, American Lecture Series, monograph in American Lectures in Anesthesiology. Edited by John Adriani, M.D., Director, Department of Anesthesia, Charity Hospital, New Orleans. Cloth. $5.25. Pp. 119, with 31 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W. Toronto 2B, Canada, 1958.

Most anesthesiologists spend their full time in hospitals. More than other physicians, with the possible exception of radiologists, they are concerned with construction and planning problems. Starting with the operating room, recovery room, intensive therapy unit, oxygen distribution systems, communications, elevators, equipment storage, and air conditioning, it is reasonable that their interest might spread to include the entire hospital. This has been the author's experience. In one small volume, he has assembled many interesting suggestions for the more efficient development of a hospital, including such broad aspects as the selection of an architect, the proper site for the building, and a more detailed analysis of key areas within.

The volume is another in the American Lecture Series and should be of value to hospital administrators, members of medical boards, engineers, physicians who are departmental chiefs, head nurses, and those in position to influence the alteration of existing structures or the planning of new ones.

Human Dissection: Its Drama and Struggle. By A. M. Lassek, M.D., Ph.D. Cloth. $6.50. Pp. 310, with 16 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

Before any authentic teaching of anatomy was possible it was necessary to dissect human bodies. Where the means of preserving them were not available, this had to be accomplished quickly in prolonged sessions so that the job could be completed before decomposition made it impossible to determine the relationships of the soft parts. The procurement of a sufficient number of bodies has always been and still is a major problem. These problems are treated from the historical viewpoint, and a detailed and interesting account of the activities of the grave robbers of bygone times is presented. Although the time devoted to anatomy in the curriculums of medical schools has decreased in recent decades, the author warns that unless this trend is reversed the quality of medical education must suffer. There is a bibliography and an index. This book should be of interest to students of medical history, anatomists, and medical educators.

A Doctor Speaks His Mind. By Roger I. Lee, M.D. Cloth. $3. Pp. 120, with 1 illustration. Little, Brown & Company, 34 Beacon St., Boston 6; Little, Brown & Company (Canada) Ltd., 25 Hollinger Rd., Toronto, Canada, 1958.

This little volume is a collection of short articles giving the author's opinion on many subjects. Dr. Lee's opinions will be respected by all members of the medical profession and should find agreement in the minds of most. He takes a dim view of governmental interference in the practice of medicine and warns that there are many things that may be pointing the way to control of the profession by the government. He writes on such subjects as "Are There Enough Doctors?" "Is Blue Cross–Blue Shield a Menace?" "Crusades," and "Hero Worship." Throughout all of these essays is woven the common sense of one of America's outstanding and beloved physicians. It is well worth reading.

Basic Clinical Parasitology. By David L. Belding, M.D. Cloth. $9. Pp. 469, with 118 illustrations. Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York 1, 1958.

Although this book, written primarily for medical students and physicians, is not meant to take the place of the author's more comprehensive "Textbook of Clinical Parasitology," it covers the subject very well. After an introductory chapter, sections are devoted to the protozoa, roundworms, tapeworms, flukes, and arthropods. A final section deals with technical methods for the diagnosis and treatment of parasitic diseases. Many helpful charts and tables are included and the diagrams and other illustrations are excellent, except for their lack of color. This is especially regrettable in the pictures of plasmodia. In the last section, insect repellents are discussed, but there is no mention of attractants. Aside from these two minor criticisms the book is excellent and should find a ready place in teaching and practice. Pertinent references to current literature are given, and both a subject index and an author index are provided.

Epilepsy Handbook. By Frederic A. Gibbs, M.D., Professor of Neurology and Director of Division of Electroencephalography, University of Illinois, School of Medicine, Chicago, and Frederick W. Stamps, M.D., Director of Consultation Clinic for Epilepsy, University of Illinois, School of Medicine. Cloth. $4.75. Pp. 101, with 8 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This handbook is exactly what the authors intended it to be: a compact, practical compendium of useful knowledge about epilepsy. In 1952, Dr. and Mrs. Gibbs published a bulky "Atlas of Electroencephalography," which included detailed data about more than 10,000 of their epileptic patients. The present handbook is a distillation of the experience of the authors. Especially useful are the 30 pages about therapy, supplemented by three summarizing tables and a two-page colored reproduction of various antiepileptic drugs. The authors give a straightforward, succinct account of epilepsy and its treatment. The book is an authoritative, handy reference for anyone who has anything to do with epileptic patients.

Medicine and Man: The Story of the Art and Science of Healing. By Ritchie Calder. Mentor book MD 217. Paper. 50 cents. Pp. 256. New American Library of World Literature, Inc., 501 Madison Ave., New York 22; cloth bound book published by George Allen & Unwin, Ltd., 40 Museum St., London, W. C. 1, England, 1958.

This paper-bound book should be interesting to those of the public who follow medical history and progress, but it also offers enough information to be useful as a reference source for physicians. Medical histories may appeal more to the older part of the population, whether it be medical or otherwise, but this may be in part because of the lack of attention that has been directed to this aspect of medicine. If presented interestingly, there is no reason why history should not be well received because at times it provides a therapeutic index. In any event this little booklet provides interesting reading.

QUESTIONS AND ANSWERS

RADIOACTIVE IODINE TEST

To the Editor:—*What are the different factors that may influence the radioactive iodine uptake in a patient and how? How long after an intravenous pyelogram or a gallbladder series can the protein-bound iodine level be determined?*

Antonio D. Talusan, M.D., Baltimore, Md.

Answer.—Several medicaments and contrast mediums for diagnostic roentgenograms may influence the collection of radioiodine. Iodides, whether administered in the form of potassium iodide, cough medicines, asthma compounds, or vitamin tablets, usually inhibit the collection of radioiodine by the thyroid gland for as many as 10 days after use of the medicament has been stopped. Antithyroid drugs, such as propylthiouracil or methimazole, can be expected to block the collection of radioiodine by the thyroid gland during the period of administration of the drug, but, within two or three days after use of the medicament has ceased, the uptake of radioiodine may be markedly elevated for some weeks. The making of an intravenous pyelogram usually blocks the uptake of radioiodine in the euthyroid patient for 5 to 10 days, and the making of a roentgenogram of the gallbladder will block the uptake of radioiodine in the same person for some months, perhaps three to six. On the contrary, in some patients with exophthalmic goiter, the uptake of radioiodine by the thyroid gland may be abnormally high immediately after intravenous pyelograms or cholecystograms are made; the reason for this is not known. Pantopaque myelograms, or examination of the bronchial tree with the aid of iodized oil may interfere with the uptake of radioiodine for as long as the iodized oil can be seen in roentgenograms. The value for serum protein-bound iodine usually is abnormally high for a week to 10 days after an intravenous pyelogram has been made. After a roentgenogram of the gallbladder has been made, the value for serum protein-bound iodine will be completely out of range for a period varying from several months to several years after the dye has been employed, depending on the particular dye used.

DESENSITIZATION TO NICKEL

To the Editor:—*A patient has been proved to be nickel-sensitive by an intradermal test (with a specially prepared solution of nickel and suitable control injection). Would it be in order to employ a method of gradually increasing amounts of specially prepared nickel solution subcutaneously—similar to the method of desensitization against other known allergens? If this is done, would there be a gradual build-up of antibodies? If not, how would desensitization be achieved? Above all, would such repeated injection of a metal be hazardous, inasmuch as it may lead to sarcoma, or may one safely proceed with such therapy?*

David N. Shapiro, M.D.
Johannesburg, South Africa.

Answer.—Sensitivity to nickel should be determined only by patch-testing with a 10% aqueous nickel sulfate solution, usually on the arm or back. The patches should remain for two days unless there is pronounced irritation. As a general rule, one cannot be desensitized against chemicals. However, Urbach and Gottlieb (Allergy, New York, Grune & Stratton, Inc., 1943, p. 264) reported on two female patients who had widespread dermatitis for months and showed a definite eczematous reaction to patch tests with even a 1:1,000,000 solution of nickel sulfate. Successful desensitization was achieved by a gradual increase in concentration of subcutaneous injections of nickel sulfate administered twice daily until a strength was reached that produced strong local and focal reactions. Attempts at desensitization to nickel by patch-testing and by ionization proved unsuccessful. Spontaneous hyposensitization to nickel may occur within months to two years if the reaction to patch test is 2+. The chances are slim, and it may take years if the reaction is 4+ (Rubin, Department of Allergy, Skin and Cancer Unit, New York, personal communication). In a series of 54 patients known to have been sensitive to nickel, who were examined after an interval of 1½ to 11 years, 31 (57%) demonstrated a persisting sensitivity and 23 gave negative results to patch tests. Eighteen of these patients continued to have eczema, although they were no longer sensitive to nickel (Morgan, *Brit. J. Dermat.* 65:84, 1953). With regard to possible malignant (sarcomatous) changes caused by subcutaneous injections of nickel sulfate solution, there is a report that nine fatal cases of cancer of the inside of the nose over a period of 11 years occurred in a nickel refining plant

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

(White, Dermatergoses; or Occupational Affections of the Skin, London, H. K. Lewis & Co., 1934, p. 161). Both nickel and arsenic were under suspicion in the high incidence of cancer in the lung and in the nasal sinuses, especially in the ethmoid, in workers exposed to nickel. It is most likely that arsenic, the impurity in nickel ores and in the sulfuric acid used to extract the copper from nickel ores (Donald Hunter, Diseases of Occupations, London, English Universities Press, 1957, p. 442), and nickel carbonyl (Hueper, Occupational Tumors and Allied Diseases, Springfield, Ill., Charles C Thomas, Publisher, 1942, p. 418), a highly toxic gas, were responsible for the high incidence of cancer in those workers. It is of interest to note that no tumors developed in mice, so susceptible to anticancer agents, when given nickel intravenously, intraperitoneally, or intramuscularly (Hueper, *J. Nat. Cancer Inst.* 16:55, 1955).

PRIMARY FAILURE OF ANTERIOR PITUITARY

To the Editor:—*A 26-year-old woman had her first menses at the age of 11 years; this was so profuse that she went into shock. Laparotomy was done, and a bicornate uterus was repaired. The ovaries were normal. In the ensuing 15 years she had completely irregular menses, and five or six times dilatation and curettage was performed for severe prolonged bleeding. Endometrial hyperplasia was reported. She has been married two years without becoming pregnant. Recent studies have shown bleeding and clotting times, platelet count, and prothrombin time to be normal; basal metabolic rate, 23%; radioactive iodine uptake, 43%; protein-bound iodine level, 6.1 mg.%; follicle-stimulating hormone level, less than 4.3 mouse units in 24 hours; cholesterol level, 195 mg.%; albumin level, 4.7 Gm.%; and globulin level, 3.1 Gm.%. Physical examination showed normal female characteristics, including a normal pelvis. A diagnosis of primary failure of the anterior pituitary was established, and cobalt radiation of the pituitary and ovaries with 100 r per month for six months was recommended. Is this diagnosis tenable? Is there any evidence to show that cobalt radiation will be of any help to this patient? What is the danger of using this amount of cobalt radiation?*

T. F. Reszel, M.D., Bayonne, N. J.

Answer.—The diagnosis of primary failure of the anterior pituitary has not been fully documented. The follicle-stimulating hormone level is low, but determination must be repeated for confirmation. Further, it would be quite unusual to have bleeding with endometrial hyperplasia in the presence of primary failure of the anterior pituitary gland. Ovarian pathology cannot be ruled out, despite a normal pelvic examination. Culdoscopy or pneumoperitoneum may be helpful in establishing the possibility of ovarian pathology. Cobalt radiation may be beneficial to this patient, but there are dangers in its use. Even though the dosage is rather small, the recommendation of treatment over a period of six months may induce ovulation and pregnancy with a possibility of damage to a very early embryo. Therefore, the possibility of pregnancy occurring during the time of radiation must be prevented. Further, there is danger of inducing genetic mutations with the possibility of abnormalities occurring in future generations. It would be very wise to explain these dangers to the patient before cobalt or x-ray irradiation is used. This consultant would certainly advise exploration of other methods of treatment before resorting to irradiation.

AMBLYOPIA EX ANOPSIA

To the Editor:—*A boy, now 13 years of age, was discovered to have defective vision in the right eye at the age of 10. No strabismus or other external defect is present. Vision in the affected eye is 20/50 and in the other eye 20/15. Competent ophthalmologists advised, even when the defect was first discovered, that glasses would be of no value in correction. There has been a slight increase in the visual defect in the weak eye in the past 12 months, but it is still advised that glasses would not help and that they may even cause harm. The diagnosis is amblyopia ex anopsia. Loss of vision is from lack of use of the eye. May further increase in visual defect be expected in the weak eye? Will proper glasses do anything to check the loss or even improve the vision? Is there a danger of this eyeball becoming smaller or of a squint developing?*

H. D. McCormick, M.D., Vincennes, Ind.

Answer.—One should have more information regarding the boy referred to in this question to properly discuss his needs. Details of ophthalmoscopic examination, refraction with and without cycloplegia, and ocular motility and some information of the boy's general physical and mental condition should be given. The diagnosis of amblyopia ex anopsia may be nothing more than a description of symptoms. It does not rule out hereditary disease or acquired disease of the sensory elements of the eye. The low visual acuity in the right eye was discovered at the age of 10, but the amount of his visual acuity at that time is not given. Three years later the vision in the affected eye is 20/50, but there is no statement as to whether this is with or without glasses. There is a bit of ambiguity in the statement "there has been a slight increase in the visual defect in the weak eye in the past 12 months." Does that mean that the visual acuity is less or greater than it was 12 months ago? The statement that "loss of vision is from lack of use of the eye" is not supported by any form of proof or information from which such a deduction can be made. Whether further increase in the visual defect is to be expected depends entirely on what is meant by visual defect. One does not speak of loss of vision as an increase in visual defect with clear understanding. Glasses are prescribed for one purpose only, and that is to improve visual acuity. There is no therapeutic value in the wearing of glasses. If the visual acuity of the right eye is better with glasses than without, then there is a good possibility that a child's vision could be improved by training with glasses and orthoptic exercises.

ELECTROMYOGRAPHY

To the Editor:—*Please evaluate electromyography in diagnosis and appraisal of muscular degeneration as related to neurological and/or muscular cause.*

Maurice J. Regan, M.D., Wilkes-Barre, Pa.

Answer.—Electromyography is being recognized by an increasing number of physicians as a valuable aid in the diagnosis of neuromuscular disease. Its most frequent use is in the diagnosis of conditions affecting the lower motor neuron, based on its ability to detect even minimal denervation of muscle. At times, when clinical tests fail to indicate clearly whether muscle dysfunction is attributable solely to pain, hysteria, malingering, disuse, upper motor neuron lesions, and the like, or whether it is the result of disease affecting the lower motor neuron, electromyography may present the only readily available objective evidence of disease of the lower motor neuron. It aids in the location of lesions affecting the lower motor neuron in the diagnosis of root, plexus, and peripheral nerve lesions, because the distribution of affected muscles can be determined more discreetly than by other methods. It is useful in detecting minimal residual innervation and in detecting reinnervation weeks before other evidence of it can be had. Characteristic patterns also result from primary disease of muscle fibers. Especially when combined with tests of the speed of conduction in nerves, electromyography is a genuine aid in the separation of myopathies from neuropathies and in separation of peripheral neuropathies from diseases affecting primarily the motor cells in the spinal cord. Electromyography offers a variety of clues to the nature of the muscle dysfunction, and, when combined with the neurological examination and other procedures, it will significantly improve the accuracy of diagnosis of diseases affecting the motor unit. Successful use of electromyography requires experience in eliciting and interpreting the electromyographic patterns of neuromuscular disease and familiarity with the neurological problems involved. One should not underestimate either the usefulness of the technique or the skill and knowledge required to use it to advantage.

FUNCTIONAL LARYNGITIS

To the Editor:—*A woman, aged 55, says she "can't talk very good." Her voice box tightens when she begins to talk, and it is a strain for her to talk. The weather has no effect on this trouble, and she has had no throat surgery of any type. The onset was 12 years ago, when she had something "break" in her throat. Before that time, she had no trouble talking. Examination with a laryngeal mirror showed her true cords to be white and smooth and to move readily with phonation and respiration. On phonation, she was able to hold the cords in approximation and there was no bowing. The remainder of her ear, nose, and throat examination revealed entirely negative results. Her blood pressure is slightly elevated (188/100 mm. Hg). Her history, with the exception of a streptococcic sore throat in 1957 and a premature menopause 12 years ago, secondary to surgery, is completely negative. The onset appeared before her premature menopause. Please give suggestions and ideas concerning the patient's complaint.*

M.D., Ohio.

Answer.—The normal approximation of the vocal cords on phonation and the absence of any visible pathology in the larynx after 12 years of vocal difficulty lend support to the presumption that the patient's symptoms are on a functional basis. Direct laryngoscopy would be of supplementary aid in ruling out organic disease and would have the additional advantage, through premedication and local anesthesia, of inducing sufficient muscular relaxation to produce a temporarily normal voice. It is entirely possible that an attack of acute laryngitis was responsible for the patient's initial episode of hoarseness and that the dysphonia has continued as a nervous phenomenon. Appraisal and voice training by a competent speech therapist should be recommended. The inquirer will find much of interest in a book entitled "The Voice of Neurosis" by Moses (New York, Grune & Stratton, Inc., 1954).

FAILURE OF INTRAVENOUS INFUSIONS

To the Editor:—*Many intravenous feedings and transfusions started in hospitals cannot be completed and must be restarted. What are the percentage and the causes of such failures? Are they all due to dislodgment of the needle in the vein, or are other factors involved?*

M.D., Pennsylvania.

Answer.—A survey was made on seven surgical wards, totaling about 200 beds, and it was found that about 450 intravenous infusions of fluid and 27 blood transfusions are given on these wards per month. This does not include those given in the operating room. Of these, 185 are started by a doctor, 250 by a nurse anesthetist, and 15 by a ward nurse. There are about 55 failures or restarts each month, an incidence of 12.2%. A number of factors are involved in failures necessitating a restart: (1) poor or inaccessible veins due to infancy, obesity, or such factors; (2) poor placement of the needle and poor choice of site, allowing easy dislodgment; (3) improper insertion of the needle, with puncture of the posterior wall, or poor anchorage, allowing dislodgment; (4) extreme restlessness of the patient; and (5) moving and transporting the patient from operating table to litter to bed in the recovery unit to litter to ward bed. There were no reactions to intravenous infusion in the period of study, so this was not a factor in failure to complete the infusion. There was a 1% incidence of minor reaction to blood transfusion, but this often is not immediate and does not necessarily terminate the transfusion prematurely. It is apparent that most failures and restarts are due to human error factors. Insertion of a plastic catheter through the needle for retention in the vein obviates some but not all of the failures. However, this consultant's experience is that thrombophlebitis eventuates in about 48 hours. Rate of flow of intravenous infusion was not incriminated but is important. Too rapid flow may cause leaking around the needle, with external compression of the vein and failure. Too slow a flow fatigues the patient to the point that he moves or may intentionally remove the needle.

LABORATORY TESTS WITH STORED SERUM

To the Editor:—*Is there published evidence showing the degree of "change" which occurs in cephalin flocculation, thymol turbidity, and the bilirubin level when serum is stored (refrigerated but not frozen) for more than 24, 48, or 72 hours? It is stated in certain textbooks that the cephalin flocculation becomes "more positive" and the bilirubin level "decreases" when such a delay occurs and, hence, results are not valid. Has this been proved, and has the degree of alteration been demonstrated by any actual quantitative study?*

M.D., California.

Answer.—The bilirubin content of serum remains unchanged for days when kept cold and in the dark (Vahlquist, *Acta Pædiat.* [supp. 5] 28:1, 1941; With, *Nord. med.* 13:721, 1942). However, serum bilirubin, especially the direct-reacting fraction, is sensitive to oxidation and sunlight (Coolidge, *J. Biol. Chem.* 132:119, 1940). There is no significant change in thymol turbidity values after storage of serum in a refrigerator for 17 to 24 hours and, in some instances, for as long as seven days (Brieger and Friedman, *Occup. Med.* 2:463, 1946). To the knowledge of this consultant, there is no published evidence showing the degree of "change" which occurs in the results of the cephalin flocculation test when serum is stored in a refrigerator. Hanger (*J. Clin. Invest.* 18:261, 1939) originally stated, "The serum should preferably be fresh and preserved at icebox temperature." According to Pohle and Stewart (*J. Clin. Invest.* 20:241, 1941), blood should be drawn six hours prior to the performance of the test. Finally, Yardumian and Weisband (*Am. J. Clin. Path.* 13:383, 1943) reported that serum which has been refrigerated for one day or longer may yield false-positive results on testing.

AEROPHAGIA

To the Editor:—*A 61-year-old woman has had a complaint of belching for three months. Dietary measures have been used, such as giving smooth diets and getting the patient to eat slowly and not to swallow any excessive air. However, nothing seems to have eased the belching. As a matter of fact, the patient states that the condition is progressing. Please give an opinion as to the possible cause and advice as to future treatment.*

Jacob J. Altholtz, M.D., Brooklyn, N.Y.

Answer.—This history is that of a typical case of aerophagia. It is, however, important to be sure about any disturbed functions of the digestive tract. One should be particularly certain about any cardiac lesion, such as an esophageal hiatus hernia. Is the patient obese? If no organic or disturbed functions of the gastrointestinal tract are found, the patient should be advised to eat foods unlikely to form gas, to chew always with her mouth closed, and to open her mouth when she belches so that she may not reswallow the air. Make sure that she has regular and adequate bowel function, and, finally, instruct her to take small doses of charcoal powder, placing one-half teaspoonful of charcoal powder on the back of her tongue and washing it down quickly with a little water, about 10 minutes before each meal.

RADIOACTIVE IODINE TEST AND STEROIDS

To the Editor:—*What is the effect of corticosteroid therapy on the uptake of radioactive iodine? If there is any effect, how is it explained physiologically?*

Norman A. Schwartz, M.D., McKeesport, Pa.

Answer.—Moderate to large doses of corticosteroids administered over a period of several weeks suppress the pituitary production of thyrotropin, thereby producing a relative hypofunction of the thyroid gland. The radioactive iodine uptake in such instances will be in the low normal or hypothyroid range, and exogenous thyroid therapy is usually indicated.

References

Paris, J., and others: Effect of Hormones on Renal Clearance of Radioiodine in Rat, Am. J. Physiol. **183**:163-166 (Oct.) 1955.

Ingbar, S. H.: Effect of Cortisone on Thyroidal and Renal Metabolism of Iodine, Endocrinology **53**:171-181 (Aug.) 1953.

Berson, S. A., and Yalow, R. S.: Effect of Cortisone on Iodine Accumulating Function of Thyroid Gland in Euthyroid Subjects, J. Clin. Endocrinol. **12**:407-422 (April) 1952.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Infant Mortality on the Increase . .
Medicare Costs Now $9 Million a Month . .
NIH Survey on Research Impact on Schools . .
Flemming Praises A. M. A. Effort on Food Faddism . .
Air Pollution Control Act Extension Due . .
Antibiotics Shipments Beyond Iron Curtain . .
Miscellany . .

INCREASE REPORTED IN INFANT DEATH RATE

Children's Bureau reports that for the first time in 22 years the rate of infant deaths is on the increase. The information was disclosed by Under Secretary Bertha S. Adkins of the Department of Health, Education, and Welfare at a convocation of the Children's Aid and Adoption Society of Orange, N. J.

Miss Adkins said that preliminary estimates for 1957 show an increase in the infant mortality rate from 26 per 1,000 live births in 1956 to 26.3. Infant deaths within the first month also increased slightly, from 18.9 per 1,000 in 1956 to 19 in 1957 and to 19.5 for the first eight months of 1958.

"This break in our progress in conserving infant life," she said, "means an estimated loss of more than 4,000 babies in 1957 and the first eight months of this year." The reverse has set in despite a doubling since 1945 of the percentage of infants who are served by well-child conferences.

Commented Miss Adkins: "Because of the large number of families that seek such services for their babies, it sometimes has been necessary to sacrifice quality of care somewhat. Many health departments are distressed that overcrowding of clinics makes it impossible for physicians to give adequate time and attention to the mothers and children who need medical guidance and care.

"These service problems are now generally more acute in the cities, because of the changing nature of city populations. In recognition of this, our social security law was amended at the last Congressional session to make grants-in-aid funds more generally available to city children. Previously, these grants had been predominantly available only to children in rural areas.

"Another development—the earlier discharge of mothers and infants from large municipal hospitals—emphasizes the need for more comprehensive supplementary community services, including services to mothers and their infants in their own homes."

MEDICARE COSTS AT RATE OF $9,200,000 A MONTH

In October, first month for cutback in the Medicare program, its costs rose to $9,200,000, highest since the operation began almost two years ago.

This fact was disclosed to the convention of the Association of Military Surgeons by Brig. Gen. Floyd L. Wergeland, who is in charge of the program. As for the future, General Wergeland says, "The ceiling is still unknown."

With costs mounting, the problem facing Gen. Wergeland is to somehow keep within the 72 million dollars Congress appropriated for the fiscal year ending next July 1. He is under instructions not to exceed this figure. If spending for the remaining months of the fiscal year continues at the October rate, the total will amount to about 106 million dollars, or more than 30 million dollars more than Congress authorized.

Commenting on restrictions that went into effect Oct. 1, General Wergeland said: "Obviously it will take some time before the kinks are ironed out of the revised procedures and programs. We hope that what we have done will achieve the ends we had in mind, but we do not know how it will work out in practice. Only time will tell."

If costs continue at a deficit pace, General Wergeland will have an opportunity to ask Congress for a deficiency appropriation when the new session opens in January.

NIH STUDYING IMPACT OF U. S. RESEARCH GRANTS ON 20 MEDICAL SCHOOLS

As a follow-up on the Bayne-Jones report, which recommends a tripling of medical research spending in 12 years, the National Institutes of Health is sounding out 20 representative medical schools to determine the impact on them of federal research grants.

To obtain the schools' reaction to the grants, as well as to the federal government's current policies and procedures in medical research, a team from NIH is touring the institutions and sitting down with officials in charge for round-table discussions.

Secretary Flemming of the Department of Health, Education, and Welfare disclosed the study in a talk to the Association of Land Grant Colleges. He said the medical school study was "just the beginning," that other similar investigations will be conducted by HEW and other federal agencies.

Mr. Flemming pointed out that these studies cannot yield the desired results unless the schools themselves make similar investigations. He added:

(Continued on next page)

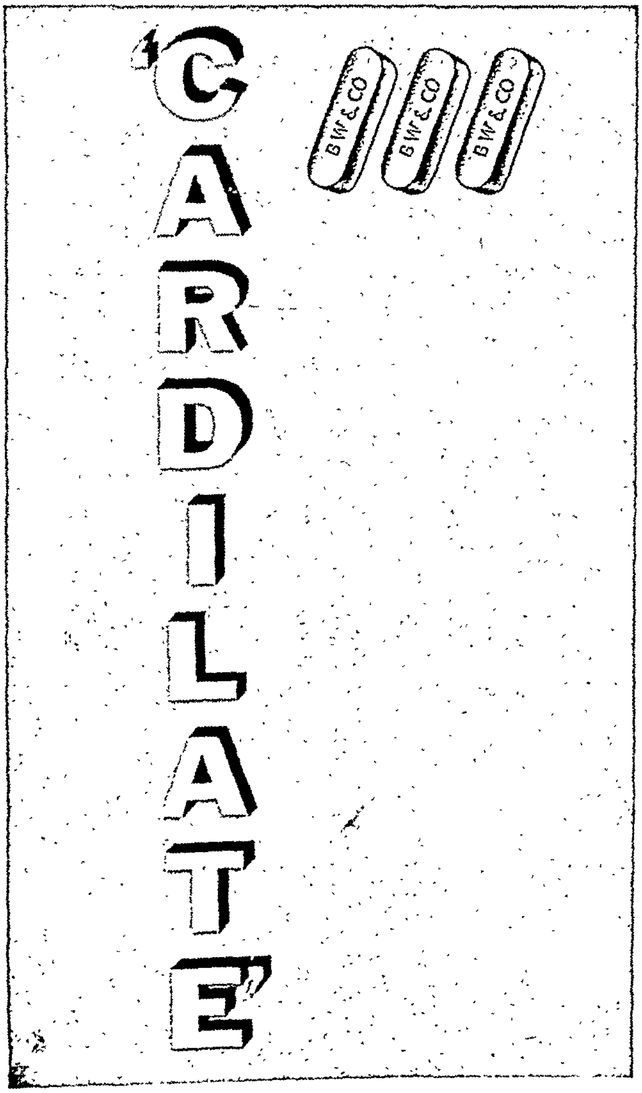
'CARDILATE' sublingual tablets for angina pectoris

"Nitroglycerin and erythrol tetranitrate when administered sublingually are among the most effective of all prophylactic agents available for the treatment of patients with angina pectoris. The comparatively prolonged duration of action of erythrol tetranitrate makes it especially valuable for clinical use."

Riseman, J. E. F., *et al.*: Circulation 17:22, 1958

'Cardilate' brand Erythrol Tetranitrate
Sublingual Tablets 15 mg., scored.

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, N. Y.



"The federal government and our institutions of higher education have entered into a far-flung and tremendously significant partnership. I think it is significant that the President and Congress have said that the time has come to evaluate this partnership—not from the standpoint of its impact on the federal government but from the standpoint of its impact on institutions of higher education."

The secretary also warned of the dangers of too much federal interest in and possible control over education that might result from federal grants. He emphasized that states and local communities should not shirk their financial responsibility to education merely because U. S. money is available.

PRAISE FOR A. M. A. JOINT EFFORT AGAINST FOOD FADDISM

The joint educational program against food fac dism and quackery sponsored by the America Medical Association, National Better Business Bu reau, and Food and Drug Administration has bee highly praised by HEW Secretary Flemming. H told his press conference:

"In fighting quackery, law enforcement, of cours is only part of the answer. It is perhaps even mor important to help the public understand the fac about nutrition and to warn people against fals claims and theories."

FDA reports a disturbing increase in quacker involving false and misleading claims for a gre variety of vitamins, minerals, and other food su plements. "Unscrupulous operations in this fiel in fact, have become the most widespread and e pensive form of medical quackery in the countr today," Mr. Flemming said. He noted that th A. M. A. estimates that this racket is now costin 10 million Americans over 500 million dollars year.

The Secretary said FDA has 350 inspectors in th country and that this number is not enough. H declined to comment at this time on the FD budget now under consideration for submission t Congress in January.

DRIVE FOR AIR POLLUTION CONTROL ACT EXTENSION EXPECTED

Extension and possible expansion of the Air Po lution Control Act appears a *strong* possibility Senator Kuchel (R., Calif.), author of the law whic is now in its fourth year, promised the Nationa Air Pollution Conference he would work towar this end.

The act authorizes a total of 25 million dollar over a five-year period for research and investiga tion projects in causes and control measures for ai pollution. Congress has appropriated about 12 mil lion dollars so far. Commented Senator Kuchel "I regret that more funds have not been made avai able." In this connection, Surgeon General Burne of the Public Health Service told the conferenc that controlling air pollution "will cost big mone but it is an essential investment."

Dr. Burney and others saw a definite link be tween cancer and air pollution. He noted, for in stance, that cancer can be produced in animals b use of concentrates of urban smog. It is known tha lung cancer death rates in the largest cities ar twice as high as those in nonurban areas. The case has not yet been proved, but the weight of circumstantial evidence grows heavier as research progresses.

Dr. Chauncey Leake, assistant dean of Ohio State College of Medicine, cited two sources of pollution potentially dangerous. One comes from nuclear weapons testing "involving all living things now and to come." The other is exhaust fumes from automobiles.

Dr. Herman Hilleboe, commissioner of health for New York and former president of the American Public Health Association, advocated a crash recruitment and training program by PHS. It should be similar in scope to the crash programs in venereal disease and tuberculosis that were instituted in 1936 and 1944, Dr. Hilleboe said. Primary emphasis then was on loaning personnel to help states and communities set up effective disease control programs.

"A review of these contributions serves to underscore how much more can be done to achieve a major break-through in air pollution control. But to accomplish this the Public Health Service must first have the go-ahead signal from Congress," Dr. Hilleboe declared.

SHIPMENT OF ANTIBIOTICS TO IRON CURTAIN COUNTRIES PERMITTED

Shipment of antibiotics to Russia and satellite countries, long stringently controlled by the U. S. government, is now permitted under a Commerce Department decision. The policy does not apply to Communist China, North Korea, and North Vietnam, which are still out of bounds.

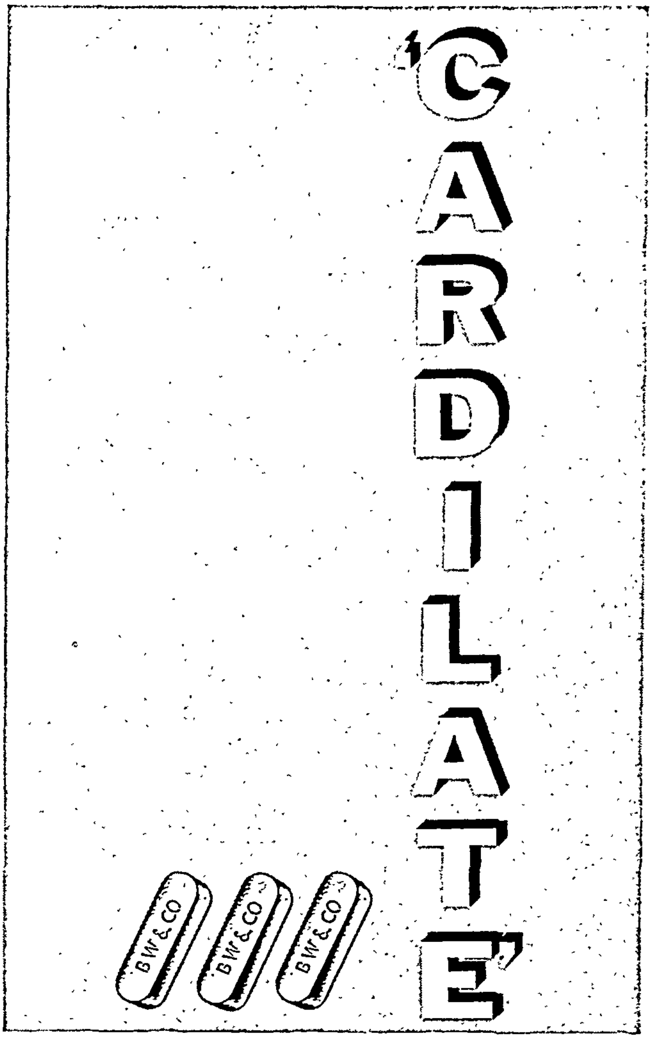
Relaxation of export controls will apply to such antibiotics as penicillin, streptomycin, aureomycin, terramycin, and similar drugs. Exporters still will have to apply for individual export licenses covering each shipment, with one exception. Shipments may be made to Poland under general export licenses.

MISCELLANY

Office of Civil and Defense Mobilization has set aside Dec. 7 as National Civil Defense Day with the slogan "Peace Through Preparedness." Plans call for exercises, rallies, exhibits, and nation-wide radio and television programs. "These activities are sponsored to impress upon every person in America that he must learn survival actions and incorporate civil defense preparedness into the pattern of his daily living," OCDM said.

The Dominican Republic has contributed another $100,000 to the special malaria fund of the Pan American Health Organization. This is the second installment of a $500,000 pledge made by the country last year for the fund, which has been set up to help finance the continent-wide eradication campaign. The U. S. has contributed $3,500,000, Venezuela $300,000, and Haiti $5,000. These are in addition to the annual quota assessments paid by member governments of PAHO.

A National Science Foundation survey indicates that three out of every four American scientists have some knowledge of at least one foreign language but only 2% have any knowledge of Russian.



'CARDILATE'
sublingual tablets for angina pectoris

Sublingual administration obviates inactivation of nitrites in gastrointestinal tract.

Most closely approximates nitroglycerin in frequency and degree of effectiveness.

'Cardilate' brand Erythrol Tetranitrate
Sublingual Tablets 15 mg., scored.

BURROUGHS WELLCOME & CO. (U. S. A.) INC.
Tuckahoe, N. Y.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. F. J. L. Blasingame, 535 North Dearborn St., Chicago 10, Executive Vice President.
1958 Clinical Meeting, Minneapolis, Dec. 2-5.
1959 Annual Meeting, Atlantic City, June 8-12.
1959 Clinical Meeting, Dallas, Texas, Dec. 1-4.
1960 Annual Meeting, Miami Beach, Fla., June 13-17.
1960 Clinical Meeting, Washington, D. C., Nov. 29-Dec. 2.
1961 Annual Meeting, New York City, June 26-30.
1961 Clinical Meeting, Denver, Nov. 28-Dec. 1.

AMERICAN

December

American Academy of Dermatology and Syphilology, Palmer House, Chicago, Dec. 6-11. Dr. R. R. Kierland, Mayo Clinic, Rochester, Minn., Secretary.

American Medical Association Clinical Meeting, Hotel Leamington, Minneapolis, Dec. 2-5. Dr. F. J. L. Blasingame, 535 N. Dearborn St., Chicago 10, Executive Vice President.

American Rheumatism Association, Mayo Clinic, Rochester, Minn., Dec. 6. Dr. Edward F. Hartung, 580 Park Ave., New York 21, Secretary.

Association for Research in Nervous and Mental Diseases, Hotel Roosevelt, New York, Dec. 12-13. Dr. Rollo J. Masselink, 700 W. 168th St., New York 32, Secretary.

Mid-West Forum on Allergy, Sheraton-Cadillac Hotel, Detroit, Dec. 6-7. Dr. John M. Sheldon, University Hospital, Ann Arbor, Mich., General Chairman.

Southern Surgical Association, Boca Raton Club & Hotel, Boca Raton, Fla., Dec. 9-11. Dr. George G. Finney, 2947 St. Paul St., Baltimore 18, Md., Secretary.

AMERICAN

1959

January

American Academy of Orthopaedic Surgeons, Palmer House, Chicago, Jan. 24-29. Dr. Clinton L. Compere, 720 N. Michigan Ave., Chicago 11, Secretary.

American Protestant Hospital Association, Jefferson Hotel, St. Louis, Jan. 27-30. Mr. Olin E. Oeschger, 740 Rush St., Chicago 11, General Secretary.

American Society for Surgery of the Hand, Palmer House, Chicago, Jan. 23-24. Dr. George S. Phalen, 2020 E. 93d St., Cleveland 6, Secretary.

International College of Surgeons, Southeastern Regional Meeting, Miami Beach, Fla., Jan. 4-7. Dr. Harold O. Hallstrand, 7210 Red Road, South Miami, Fla., Chairman.

International Medical Assembly of Southwest Texas, Gunther Hotel, San Antonio, Tex., Jan. 26-28. Mr. S. E. Cockrell Jr., 202 W. French Pl., San Antonio, Tex., Executive Secretary.

National Association of Methodist Hospitals and Homes, Sheraton-Jefferson Hotel, St. Louis, Jan. 27-29. Mr. Olin E. Oeschger, 740 Rush St., Chicago 11, General Secretary.

Rocky Mountain Traumatic Surgical Association, Aspen, Colo., Jan. 28-31. Dr. Charles B. Bartell, 1600 Orange Ave., Long Beach 13, Calif., Secretary.

Western Society for Clinical Research, Carmel-by-the-Sea, Calif., Jan. 29-31. Dr. William N. Valentine, University of California Medical Center, Los Angeles 24, Secretary.

February

American Academy of Allergy, Morrison Hotel, Chicago, Feb. 9-11. Dr. Bram Rose, Royal Victoria Hosp., Montreal, Quebec, Secretary.

American Academy of Forensic Sciences, Drake Hotel, Chicago, Feb. 2[illegible]-28. Dr. Walter J. R. Camp, 1853 W. Polk St., Chicago 12, Secretary.

American Academy of Occupational Medicine, Boston, Feb. 11-13. Dr. L. Blaney, 1608 Walnut St., Philadelphia 3, Secretary.

American College of Radiology, Drake Hotel, Chicago, Feb. 6-7. Mr. William C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Director.

American College of Surgeons, Sectional Meeting, Shamrock Hilton Hotel, Houston, Texas, Feb. 2-4. Dr. J. Griffin Heard, 6410 Fannin St., Houston 25, Texas, Chairman.

California Medical Association, Sheraton-Palace Hotel, San Francisco, Feb. 22-25. Mr. John Hunton, 450 Sutter St., San Francisco 8, Executive Secretary.

Colorado State Medical Society, Midwinter Clinical Session, Shirley-Savoy Hotel, Feb. 17-20. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

Congress on Industrial Health, Netherland Hilton Hotel, Cincinnati, Feb. 16-18. Dr. B. Dixon Holland, 535 N. Dearborn St., Chicago 10, Secretary.

March

Alaska Territorial Medical Association, Baranof Hotel, March. Dr. Robert B. Wilkins, 1121 Fourth Ave., Anchorage,

American Broncho-Esophagological Association, The Hot Springs, Va., Mar. 8-9. Dr. F. Johnson Putney, 1712 Philadelphia 3, Secretary.

American College of Allergists, Fairmont Hotel, San Francisco, 15-20. Dr. M. Coleman Harris, 450 Sutter St., San Francisco,

American Laryngological Association, The Homestead, Va., Mar. 8-9. Dr. James H. Maxwell, University Hospital, Mich., Secretary.

American Laryngological, Rhinological & Otological Society, Homestead, Hot Springs, Va., Mar. 10-12. Dr. C. Stewart Medical Arts Bldg., Rochester 7, N. Y., Secretary.

American Orthopsychiatric Association, Sheraton-Palace Hotel, Francisco, Mar. 30-Apr. 1. Dr. Marion F. Langer, 1790 Broadway, York 19, Executive Secretary.

American Otological Society, The Homestead, Hot Springs, Va., 13-14. Dr. Lawrence R. Boies, University Hospital, Minneapolis, Secretary.

Michigan Academy of General Practice, Post-Graduate Sheraton-Cadillac Hotel, Detroit, Mar. 4. Dr. F. P. Rhoades, cabees Bldg., Detroit 2, Convention Manager.

National Health Council, Palmer House, Chicago, Mar. Philip E. Ryan, 1790 Broadway, New York 19, Executive

National Multiple Sclerosis Society, New York, Mar. 9. Mr. Vail, 257 4th Ave., New York 10, Secretary.

Southeastern Surgical Congress, Deauville Hotel, Miami Beach, Mar. 9-12. Dr. Benjamin T. Beasley, 45 Edgewood Ave., S. E., Ga., Secretary.

Southwestern Surgical Congress, New Brown Palace Hotel, Mar. 30-Apr. 1. Dr. C. M. O'Leary, 1213 Medical Arts Bldg., City, Okla., Secretary.

April

Aero Medical Association, Hotel Statler, Los Angeles, Apr. Thomas H. Sutherland, P. O. Box 26, Marion, Ohio, Secretary.

Alabama, Medical Association of the State of, Birmingham, 9-11. Mr. William A. Dozier, 17 Moulton Bldg., Montgomery, Secretary.

American Academy of General Practice, San Francisco, Mr. Mac F. Cahal, Volker Blvd., at Brookside, Kansas City Executive Secretary.

American Academy of Neurology, Statler Hotel, Los Angeles, 18. Dr. Joseph M. Foley, Boston City Hosp., Boston, Secretary.

American Association of Anatomists, Seattle, Apr. 1-3. Dr. B. Univ. of Pa., Med. School, Philadelphia 4, Secretary.

American Association for Cleft Palate Rehabilitation, Hotel, Philadelphia, Apr. 30-May 2. Dr. D. C. Spriestersbach Hosps., Iowa City, Ia., Secretary.

American Association of Genito-Urinary Surgeons, Seaview Club, Absecon, N. J., Apr. 15-17. Dr. William J. Engel, 2020 St., Cleveland 6, Secretary.

American Association of Immunologists, Atlantic City, N. J., 17. Dr. Calderon Howe, 630 W. 168th St., New York 32,

American Association of Pathologists and Bacteriologists, Hotel, Boston, Apr. 23-25. Dr. Russell L. Holman, 1542 New Orleans 12, Secretary.

American Association of Railway Surgeons, Drake Hotel, Apr. 16-18. Dr. Chester C. Guy, 5800 Stony Island Ave., Secretary.

American Association for the Study of Neoplastic Diseases, Greystone, Gatlinburg, Tenn., Apr. 30-May 4. Dr. Bruce H. 268, Gatlinburg, Tenn., Secretary.

American Association for Thoracic Surgery, Statler Hotel, geles, Apr. 21-23. Dr. Hiram T. Langston, 7730 Carondelet Louis 5, Secretary.

American College of Obstetricians & Gynecologists, Atlantic City, N. J., Apr. 5-9. Dr. John C. Ullery, 15 S. Clark cago 3, Secretary.

American College of Physicians, Conrad Hilton Hotel, 20-24. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Secretary.

American Goiter Association, Chicago, Apr. 30-May 2. Dr. McClintock, 149½ Washington Ave., Albany, N. Y., Secretary.

American Physiological Society, Atlantic City, N. J., Apr. Ray G. Daggs, 9650 Wisconsin Ave., Washington, D. C., Secretary.

American Psychiatric Association, Civic Auditorium, Apr. 27-May 1. Dr. C. H. Hardin Branch, 156 Westminster Lake City, Secretary.

American Radium Society, The Homestead, Hot Springs, Va., Dr. Robert L. Brown, Robert Winship Clinic, Emory lanta 22, Ga., Secretary.

American Society of Biological Chemists, Atlantic City, 13-18. Dr. F. W. Putnam, Univ. of Fla. Medical School, Fla., Secretary.

(Continued on page 32)

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 13 CHICAGO, ILLINOIS NOVEMBER 29, 1958

COPYRIGHT, 1958, BY AMERICAN MEDICAL ASSOCIATION

SAFETY OF LIQUID PLASMA—A STATISTICAL APPRAISAL

Wynn A. Sayman, M.D., Chicago, Ross L. Gauld, M.D., Washington, D. C., Shirley A. Star, Ph.D.
and
J. Garrott Allen, M.D., Chicago

Plasma was compared with whole blood with respect to the frequency of hepatitis after transfusion. The data represent more than 15 years of experience with a blood bank; the three categories of patients successfully followed up numbered 433 (plasma only), 1,242 (plasma plus blood), and 2,343 (blood only). Each plasma pool represented about 28 to 30 donors. After being tested for bacteriological contamination the plasma was stored in the fluid state for about six months in a room where the temperature ranged from 76 to 96 F (24.4 to 35.5 C) and averaged 89 F (31.6 C). The findings clearly showed that there is very little chance of serum hepatitis in a patient receiving pooled plasma stored for six months under these conditions, for there was not a single case of hepatitis among 305 patients who survived 180 days or longer after transfusions of plasma representing 12,345 donors. The incidence of hepatitis among patients who had received both plasma and whole blood was attributable solely to the whole blood. Plasma stored at lower temperatures than those recommended can transmit hepatitis despite a seven-month period of storage. Daily temperature records of the storage-space are therefore an essential feature of the procedure here advocated.

THIS REPORT summarizes the experience of the University of Chicago Blood Bank with respect to viral hepatitis among patients who received transfusions of plasma and/or whole blood. The patients studied were given transfusions during a period of slightly over 15 years, between September, 1942, and January, 1957, during which time the plasma administered was processed as described below. Of particular interest is the fact that no case of hepatitis occurred which could be ascribed to the use of plasma made in this manner. Follow-up data on the course of the recipients is complete for all but 2% of the patients who were given transfusions, and the results indicate that the risk of transmission of serum hepatitis from plasma can be reduced to less than that incurred with transfusions of whole blood.

Materials and Methods

Processing of Plasma.—The operation of the blood bank at the University of Chicago and its method of processing plasma has been described in detail in previous reports.[1] Briefly, all blood after being drawn from the donors was refrigerated until used for transfusions. If not used within five or six days, it was converted into plasma. Thus, the blood which was made into plasma was that which had become outdated before use. Beyond this, there was no selection. The plasma was first made up into preliminary pools from about 10 donors and placed in 2,000-ml. flasks. A final pooling was then made; this consisted of plasma which had been made from the blood of about 28 to 30 donors. It was then tested for bacterial contamination. Thereafter, it was

---

From the William H. Danforth Laboratory for Research in Surgery, Department of Surgery, University of Chicago (Drs. Sayman and Allen), the Walter Reed Army Institute of Research (Dr. Gauld), and the National Opinion Research Center, University of Chicago (Dr. Star).

stored in the fluid state for periods of about six months in a room where the temperature ranged from 76 to 96 F (24.4 to 35.5 C) and averaged 89 F (31.6 C). (Demands created considerable variations in time and temperature, which will be reported later.)

Classification of Patients.—Recipients of transfusions were placed in three categories: (1) those who received plasma with no whole blood, (2) those who received both plasma and blood, and (3) those who received blood only.

Follow-up studies were attempted on all patients in groups 1 and 2 and on a 21% systematic random sample of group 3. The completeness of follow-up information for each group is indicated in table 1. In the majority of instances, the outcome was found in the records of either the blood bank or the hospital. An intensive effort was made to obtain follow-up data on patients whose final outcome was not previously known. The period of follow-up study comprised the six-month post-transfusion period, the generally accepted spread of the incubation period for serum hepatitis.

Table 1.—*Completeness of Follow-up Records in Three Groups of Patients Who Received Transfusions*

Follow-up and Survival Time After Transfusion	Group 1, Plasma Only (Sept., 1942-Jan., 1957)		Group 2, Plasma Plus Blood (July, 1946-Jan., 1957)		Group 3, Blood Only (21 % Random Sample) (July, 1946-Jan., 1957)	
	No.	%	No.	%	No.	%
Died in less than 30 days..	101	22.9	410	32.4	206	8.6
Died in 30-180 days........	27	6.1	179	14.2	243	10.2
Survived 180 days *or longer*..............	305	69.0	653	51.7	1,894	79.3
Not accounted for.........	9	2.0	21	1.7	45	1.9
Total	442	100.0	1,263	100.0	2,388	100.0
Total accounted for....	433	98.0	1,242	98.3	2,343	98.1

Due to the seriousness of the primary illnesses of patients who received transfusions, there was considerable mortality during the period of observation. Sixty-nine per cent of those who received plasma alone survived 180 days or longer; 52% of those who received both plasma and whole blood survived this period; and 79% of those given blood only lived 180 days or longer. In groups 1 and 2, the majority of deaths occurred before the seventh post-transfusion day, but in group 3 the majority of deaths did not occur until about the sixth week. The final analysis has therefore been confined to patients who developed homologous serum jaundice and to the survivors whose follow-up history covered at least 180 days after any episode of transfusion.

Group 1: In group 1 were 305 patients who received transfusions of plasma but no whole blood, who survived, and who were followed up for a full six months. An additional 128 patients died under known conditions but without jaundice before the 180th day; 9 patients could not be traced for the full 180-day period, but these, too, did not develop homologous serum jaundice. The initial number of patients comprising this group was 442. Thus, for this entire group, follow-up studies were successful in 98.0% of all patients who received transfusions.

Group 2: Group 2 included 653 patients who received transfusions of blood, together with plasma, and who survived for at least six months, except for three who died of homologous serum jaundice prior to this date. An additional 589 patients in this group died without jaundice or hepatitis prior to the 180th day; 21 patients could not be traced completely. The initial number of patients given transfusions in this group was 1,263, of which successful follow-up records were obtained for 98.3%.

Group 3: A total of 1,894 patients who received blood without plasma survived six months or longer; they were followed up for the full 180 days or until the occurrence of an episode of homologous serum jaundice. An additional 449 patients died prior to this time of known conditions without jaundice; and 45 patients could not be completely traced. The initial total of the patients in this group was 2,388, which comprised a 21% systematic random sample of 11,382 patients. Follow-up data were successfully obtained in 98.1% of all patients in this sample.

Diagnosis.—The diagnosis of serum hepatitis was clinical. A patient who developed clinical jaundice within 30 to 180 days after transfusion was considered to have serum hepatitis unless there was unequivocal evidence either clinically or pathologically that the jaundice was of different etiology. This criterion was applied consistently to all groups in the study, so that any anicteric cases of hepatitis which may have occurred were excluded from all three categories. As most patients were exposed to blood or plasma from more than one donor during the course of their hospital stay on any single admission, it was necessary to take into account the number of donors to which each patient was exposed and the duration of follow-up after each transfusion in arriving at our final conclusions. A few patients had more than one admission during which they received transfusions. However, each patient was counted only once, and if he developed homologous serum jaundice in the course of any admission he was always classified as having developed the disease.

Findings

The results of this follow-up study are summarized in table 2. Note that the number of donors to which the recipients were exposed varied greatly according to the type of transfusion received. Thus, on the average, the recipients of whole blood alone were exposed to the risk of contracting serum hepatitis from one or more of 3 donors, whereas those who received plasma only were exposed to the risk of contracting hepatitis from any one of 41 donors. These are average values, but they serve to illustrate how the risk of contracting hepatitis is compounded as the number of donors to which the recipient is exposed increases. Direct comparisons of the crude attack rates, therefore, are not sound because they fail to take into account donor exposure. Accordingly, calculations have been made of the number of cases which might have been expected to occur in each of the groups receiving plasma. These expectancies are based on average probabilities which are derived from the experience of those patients who received whole blood and no plasma. These "expected cases" represent the number which would reasonably be anticipated had each donation of plasma to a pool retained the same chance of infectivity as blood from the same donor population. The expectancy rates are shown in table 2, and, since their derivation is of some importance, the procedure used is given in detail under Calculation of Expected Cases.

The findings are definite and clear cut. Among the 305 surviving recipients of plasma alone, there might have been expected 48 cases of hepatitis if the plasma had not been processed as described. Not a single case occurred in this group, an outcome which can be conservatively attributed to chance less than once in 1,000 times. Similarly, among the 653 recipients of both blood and plasma, 21 cases of hepatitis were observed. The expectancy for this group was 123 cases, 24 of which could be ascribed to the amount of blood which was transfused. Thus, the 21 cases encountered in this group did not exceed the number expected from blood alone. In other words, over a 15-year period, our plasma subjected to storage in the fluid state for six months at temperatures ranging from 76 to 96 F has not been incriminated as the source of a single case of serum hepatitis. In fact, regardless of the greater donor exposure of the patients receiving plasma, it has produced no more hepatitis when given with blood than would be expected from blood alone.

Calculation of Expected Cases

Because the recipients of plasma were exposed to blood from many more donors than those who received blood alone, the risk of acquiring serum hepatitis among them is greater than is immediately apparent. Any calculation of the number of cases which might be expected to occur must take into account not only the number of recipients but also the number of donors to which each of the recipients was exposed. The expected number of cases shown in table 2 were calculated on the basis of average probabilities derived from the experience of those who received transfusions of blood alone.

In order that these expectancies might be calculated, four assumptions have been made: 1. The plasma which was made from unselected, outdated blood was representative with respect to infectivity for serum hepatitis of all blood drawn in this blood bank. 2. The experience of the 21% sample of fully investigated recipients of whole blood was representative of the experience of the 11,382 patients who received transfusions of blood but no plasma. 3. Infectious blood from one donor is sufficient to contaminate an entire pool of plasma. 4. Twenty-two per cent of recipients of infectious blood develop serum hepatitis with recognizable jaundice (a probability of 0.22). Assumptions 1, 2, and 3 require no comment. Assumption 4 is based on the study of Sborov and associates,[2] who investigated the incidence of serum hepatitis among soldiers who received infected plasma in Korea.

The first step in the calculation of expected cases is to determine the probability of blood from a single donor being infectious. This may be derived from the experience of those who received transfusions of whole blood. The basic data and calculations are as follows: total number of recipients of whole blood, 1,894; average number of donors per recipient, 3; number of certain cases of serum hepatitis, 36; and estimated number of recipients of infectious blood (see assumption 4), 164 (36 × 100 ÷ 22). The probability of the patient's receiving infectious blood is therefore 164 ÷ 1,894, or 0.087 (87 chances in 1,000), and the probability of his not receiving infectious blood (1 — 0.087) is 0.913.

TABLE 2.—*Patients, Donors, and Risk of Serum Hepatitis with Transfusion of Plasma and/or Whole Blood*

		Donors		Cases of Serum Hepatitis		
				Observed		
Group	Patients, No.	Total No.	Av./Patient	No.	%	Expected No.*
1. Plasma only	305	12,345	40.5	0	0.0	48
2. Plasma plus whole blood	653	40,841	62.5	21	3.2	123
Blood		3,706	5.7			24
Plasma		37,135	56.9			118
3. Blood only	1,894	5,626	3.0	36†	1.9†	36
				8‡	0.4‡	
				44	2.3	

* Number of cases which would be expected to occur if plasma had same infectivity as blood from which it was processed.
† Certain.
‡ Possible.

But, on the average, these patients received blood from three donors. This means that 0.913 is the probability of not receiving infectious blood from any of the three donors. The probability of not receiving infectious blood from a single donor is the cube root of this value, or 0.97. It follows that the probability of receiving infectious blood from one donor is (1 — 0.97) or 0.03 (three chances in 100, or 3%). This is the probability of blood from a single donor being infectious.

Having determined this probability, it is now possible to calculate the probability of a patient's receiving infectious blood or plasma if transfusion is done with material from any specified number of donors. This is most readily calculated by finding the probability that all donors are noninfectious and subtracting this value from unity. The pertinent calculations in the present study are given in table 3.

The probabilities in table 3 will permit us to calculate the number of cases of hepatitis which would have occurred among those who received plasma if the plasma had not been processed to render it noninfectious.

Group 1.—A total of 305 patients received plasma only from 41 donors, on the average, so that the probability that at least one of these was infectious is $(1 - q^{41}) = 0.712$ (71.2%). The probability of a recipient being susceptible is 0.22 (see assumption 4). Therefore, the expected number of cases is 48 ($305 \times 0.712 \times 0.22$).

Group 2.—First, in regard to the cases expected from both blood and plasma, a total of 653 patients each received blood from 63 donors, on the average. Therefore, the probability that blood from at least one of these donors was infectious is $(1 - q^{63})$ or 0.853 (85.3%). The probability of a recipient being susceptible is, as before, 0.22 (see assumption 4). Therefore, the number of expected cases is 123 ($653 \times 0.853 \times 0.22$).

Second, whole blood alone given to this group came, on the average, from six donors, so the probability that blood from at least one of the six was infectious is $(1 - q^{6})$ or 0.167 (16.7%) and the expected number of cases is 24 ($653 \times 0.167 \times 0.22$).

Table 3.—*Probabilities for Infectivity of Transfused Blood or Plasma*

	Probabilities				
No. of Donors per Recipient	All Donors Noninfectious		One or More Donors Infectious		
1	(q)	0.970	$(1\text{-}q)$	0.030	(3.0%)
3	(q^{3})	0.913	$(1\text{-}q^{3})$	0.087	(8.7%)
6	(q^{6})	0.833	$(1\text{-}q^{6})$	0.167	(16.7%)
41	(q^{41})	0.288	$(1\text{-}q^{41})$	0.712	(71.2%)
57	(q^{57})	0.176	$(1\text{-}q^{57})$	0.824	(82.4%)
63	(q^{63})	0.147	$(1\text{-}q^{63})$	0.853	(85.3%)

Third, the plasma given to this group came, on the average, from 57 donors, so the probability that blood from at least one of these was infectious is $(1 - q^{57})$ or 0.824 (82.4%) and the expected number of cases is 118 ($653 \times 0.824 \times 0.22$).

There were 21 observed cases among this group of 653 recipients. These can all be accounted for on the basis of infection from the blood transfusions, and it is not necessary to assume that any were acquired from transfusions with plasma. The total expected number of cases in this group was 123, which is less than the sum of the 24 from blood and the 118 from plasma. This apparent discrepancy comes from the fact that in these calculations it was possible for persons to be infected from either or both blood and plasma.

Comment

The fortuitous circumstances which led us to propose the value of this method for the processing of pooled plasma as a means for minimizing or eliminating the risk of transmitting homologous serum jaundice were described in 1950.[1a] In order to prove this thesis, it has been necessary to enlarge our clinical experience in order to rule out by statistical tests the possibility that the same results could be obtained by chance alone. There are a number of methods which can be applied to achieve this purpose. We have, in fact, attempted a variety of procedures for computing expectancy rates from our plasma, only one of which is reported here (see Calculation of Expected Cases). Another is an extremely conservative, highly complex method and will be reported as a statistical model from which the most rigorous testing of the safety of our plasma can be made.[3] However, all of these methods led to the same general conclusion, namely, that donations used as blood carry a greater risk of producing homologous serum jaundice than those processed and administered as pooled plasma.

However strong this conclusion may appear to be, it cannot be interpreted to apply to circumstances other than the two specific ones which apply to our experience: First, the product has been maintained in a fluid state with a holding period of six months, although in our experience it has been often somewhat shorter and occasionally longer according to fluctuations in clinical demands. Second, an effort is made to maintain a temperature range which is consistently higher than ordinary room temperature throughout the six months; a conscious effort has been made by us since 1950 to sustain the temperature at 89 F. During the past year, constant temperature storage facilities have been acquired to effect better control. An example of the importance of temperature control and the striking of the correct balance between storage time and storage temperature is our experience with a pool of plasma purchased from another blood bank. In that blood bank it is standard procedure to store the fluid plasma for 12 months at ordinary room temperature before use. Because our plasma supply was exhausted, we obtained and used a pool of plasma from this outside source after it had been stored for only seven months. Forty-two patients were given transfusions with the plasma of this pool, and seven developed hepatitis with jaundice. Temperature measurements in the storage room of the other blood bany averaged 72 F (22.4 C), about 10 C lower than we have employed. Therefore, it is our belief that storage at ordinary room temperatures necessitates a longer holding period to render the plasma noninfective, a view which is consistent with knowledge about decay in virus activity in relation to temperature.[4]

Another episode has also come to our attention since these studies were completed. Recently, two cases of viral hepatitis occurred after transfusions with plasma prepared in our blood bank. In both instances the plasma had been prepared under a modification of the usual temperature and holding period. Each patient was exposed to a different pool, and no cases occurred among the other recipients of these pools. These cases may be ascribed to errors in judgment in efforts further to improve the processing of plasma or to the coincidental occurrence of infectious hepatitis. The latter is an ever-present potential that will eventually occur and tend to confuse the interpretation of cases when the same procedure has been successfully used for many years.

It is important that this report not convey the impression that the current procedure and findings are new, as interim previous reports have appeared from this laboratory since 1950.[5] Similar findings have also been reported by Hoxworth and Haesler.[6] However, the details required for us to complete a full and accurate analysis of clinical material from which reliable statistical computations could be made have only been possible during the past three years. This study has proved worthwhile, for it is now possible to demonstrate that the risk of transmitting serum hepatitis from pooled plasma can be overcome by this simple processing procedure under the circumstances detailed. The proteins of plasma so treated are not disturbed sufficiently to affect their usefulness in the treatment of hypovolemic shock or hypoproteinemia,[7] and there has been no clinical evidence that this product is antigenic. If desired, the product may be subjected to lyophilization satisfactorily after processing is complete.

The obvious importance of the control and detection of bacterial contamination does not present insurmountable problems, but such controls are imperative. As Hoxworth and Haesler [8] have shown, bacterial-restraining filtration may prove useful in reducing the loss of plasma from contamination.

Summary and Conclusions

Follow-up studies were done in three categories of patients who received transfusions at the University of Chicago: those receiving pooled plasma without whole blood, those receiving plasma plus blood, and those given blood without plasma. Complete follow-up studies were possible for 98% or more of the patients comprising each group.

The findings disclosed the following attack rates for serum hepatitis, with jaundice, compared with the number we should have encountered had our pooled plasma been infectious (icterogenic): In the group receiving pooled plasma without blood no cases occurred, whereas 48 would have been expected. The established attack rate for those receiving plasma plus blood was 3.2%, 123 cases would be expected in this series, with 24 from blood received; 21 cases were found, or approximately the number expected. The attack rate among the group receiving blood without plasma was 2.3%; in this group, the average patient was exposed to 3.0 units of blood, whereas the blood exposure for those in the group receiving plasma plus blood was 5.7 units, irrespective of the plasma that was also given. The slightly higher attack rate for the plasma plus blood group compared with those receiving blood alone was therefore to be expected. The pooled liquid plasma was not to be incriminated in any patient as the cause of serum hepatitis.

The probability that the results obtained in this clinical study could have occurred by chance alone, computed statistically, proved to be less than 1 in 1,000. The statistical method reported in this study is but one of several which were applied; regardless of the method used, the conclusions remained unchanged.

There is very little chance that pooled liquid plasma will produce serum hepatitis after being stored approximately six months at an average temperature of 89 F (31.6 C). Provided adequate bacteriological safeguards are used to insure sterility, this procedure will enable the preparation of pooled plasma which is essentially free from the risk of transmitting serum hepatitis.

When these same conditions prevail in plasma preparation, except that the temperature is 9.2 C lower (22.4 C, or 72 F), serum hepatitis can be transmitted despite a seven-month period of storage. Daily temperature records are therefore essential to the safety and success of the procedure we have used.

950 E. 59th St. (37) (Dr. Allen).

This study was supported by a grant from the Surgeon General's Office, U. S. Army.

References

1. (*a*) Allen, J. G., and others: Homologous Serum Jaundice and Its Relation to Methods of Plasma Storage, J. A. M. A. **144:**1069-1074 (Nov. 25) 1950. (*b*) Allen, J. G.; Inouye, H. S.; and Sykes, C.: Homologous Serum Jaundice and Pooled Plasma—Attenuating Effect of Room Temperature Storage on Its Virus Agent, Ann. Surg. **138:**476-486 (Sept.) 1953.

2. Sborov, V. M.; Giges, B.; and Mann, J. D.: Incidence of Hepatitis Following Use of Pooled Plasma: Follow-up Study of 587 Korean Casualties, A. M. A. Arch. Int. Med. **92:**678-683 (Nov.) 1953.

3. Savage, L. J.; Star, S. A.; and Blough, R.R.: To be published.

4. Lauffer, M. A.: Viruses, from the 20th Annual Priestly Lectures, Pennsylvania State College, 1946.

5. (*a*) Allen, J. G.; Enerson, D. M.; Barron, E. S. G.; and Sykes, C.: Pooled Plasma with Little or No Risk of Homologous Serum Jaundice, J. A. M. A. **154:**103-107 (Jan. 9) 1954. (*b*) Reference 1.

6. Hoxworth, P. I., and Haesler, W. E., Jr.: Safety of Stored Liquid Plasma: Clinical Study, Ann. Surg. **144:**336-348 (Sept.) 1956.

7. Hoch, H., and Chanutin, A.: Electrophoretic Study of Human Plasma Stored at Room Temperature, J. Biol. Chem. **209:**661-669 (Aug.) 1954. Reference 5*a*.

8. Hoxworth, P. I., and Haesler, W. E., Jr.: Plasma Transfusion Without Transmission of Serum Hepatitis, J. A. M. A. **166:**1291-1293 (March 15) 1958.

THE PHYSICIAN HIMSELF

Charles E. McArthur, M.D., Olympia, Wash.

We have come to this scientific assembly primarily, it is true, to learn what we, as physicians, can do to improve the care we give our patients. Little thought and less effort have we given to the maintenance of the health of the individual who is to render these services to the sick. It is of the physician himself I speak. We, as individuals, should be interested to some extent in promoting our own health, and we do care, more than our health record would indicate. There are some among us, as well as among our critics, who would condemn such effort to better our own health record as a selfish endeavor. Yet, if by giving thought, we could add only one year to the working life of the American physician we would conserve more than 200,000 work-years. From the standpoint of good medical care, these years would be the most valuable years of a doctor's career—the product of the perfection of medical skills and judgment based on a lifetime of experience. The economic and medical implications of this added year would be equivalent to adding approximately 7,000 highly trained and experienced doctors to our medical task force.

The fact that the medical profession as a group has a higher mortality from heart disease than its counterpart in the general population should give cause for serious reflection. Nervous strain may well be a factor in the higher heart disease mortality. Another possible explanation for the poor record of physicians as far as heart disease is concerned is the lack of daily physical exercise. The problem must be worked out by each individual physician. First, establish a way of life that includes reasonable respect for your own health. Make regular daily exercise a part of your routine. If nervous tension cannot be avoided, compensate with adequate vacations. Finally, have a physical check-up each year.

"A Yearly P. E. for Every M.D."

In 1955, at the Atlantic City convention, I initiated a project to promote a yearly physical examination for every physician. With the help of members of the Academy of General Practice and with the cooperation and assistance of Fellows of the American College of Cardiology we were able to run electrocardiograms and provide heart consultations on more than 1,000 physicians that first year. Through the help also of the National Tuberculosis Association, chest photofluorograms were made on approximately the same number of doctors. These films were shown to the physician-patients by Dr. Julius Wilson of the American Trudeau Society. Dr. Wilson discussed their findings with all who wished to consult with him.

The number of physicians seeking even this small start on a physical examination confirmed my belief that physicians, especially those from the smaller communities where they live, so to speak, in glass houses, welcomed an opportunity to be examined by and consult with a physician who was a stranger. During the past three annual sessions of the American Medical Association, we have made approximately 3,000 electrocardiograph tracings and chest photofluorograms on physicians. This has been primarily a service project. An analysis of the findings is shown in the table and in figure 1. Our facilities have been limited and the surroundings crude and bare, certainly, as compared to the plush and ultramodern private offices we provide for our patients. But in spite of these handicaps, few and only minor errors occurred. Credit must be given to the dedicated cardiologists who devoted their time and skill to interpreting the electrocardiograms and to consultation with the physician-patients.

Of the first 3,228 electrocardiograms, we found nearly 18% to be either definitely abnormal or borderline. Chest photofluorograms were taken of somewhat fewer (2,749) physicians. These showed about 15.5% suspected or definite abnormalities, including, in addition to tuberculosis, chest neoplasms and cardiovascular abnormalities. Unfortunately, we were unable to correlate the heart examinations with the chest films. Many who had electrocardiograms did not have chest films, and we found that some who showed evidence of heart disease on the chest film had not had electrocardiograms.

Previous Studies on Physicians' Health

Master, Chesky, and Pordy,[1] in 1951, reported a study on 200 physicians. It is interesting to note that they found approximately 15% abnormal electrocardiograms. While we have no comparable studies on the general population with which to compare our findings, we do have the work of Dublin and Spiegelman[2] who, in 1947, published figures on longevity and mortality of physicians. These showed a higher annual death rate for phy-

---

Chairman's address, read before the Section on General Practice at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

sicians than for their counterpart in the general population. This was strikingly evident for the leading cause of death, viz., diseases of the heart and coronary arteries. The recorded death rate for physicians from these diseases was 1.8, or nearly double, that of white males of the same age groups in the general population.

Results of Chest X-rays in Physicians at A. M. A. Annual Meetings

Results	1955 No	1955 %	1956 No.	1956 %
Negative	895	84.1	808	83.5
Unsatisfactory	1	0.1	...	...
Suspected tuberculosis	64	6.0	...	...
Minimal activity	...	...	55	5.7
Moderate activity	...	...	3	0.3
Far advanced	...	...	0	0.0
Cardiovascular disease	44	4.2	42	4.3
Other pathology	60	5.6	59	6.1
Totals	1,064	100.0	965	100.0

In 1956, Dickinson and Martin[3] reported a more favorable death rate from all causes for physicians as compared to their corresponding age groups in the general population, but, again, for the leading cause of death, heart disease, physicians still led by an uncomfortable margin. In 1948, Dublin and Spiegelman,[4] in a report on mortality of specialists, further pointed out that the over-all mortality of specialists was approximately 30% less than for general practitioners. Conceivably the great increase in specialization or limited practice could account in some degree for the more favorable death rate reported by Dickinson and Martin a decade later.

The Problem

The problem is, why should physicians as a group have a higher mortality from heart disease than the general population, and why should the family physician have a higher mortality than the specialist? The factors involved in both questions are probably much the same but vary in degree. There are a number of factors operating to a greater or less degree in various areas.

City Versus Country Doctors.—Dublin points out that the specialists are concentrated in the urban centers where they have the advantage of large hospital facilities and also that the larger income which they enjoy permits them to take better care of themselves by taking frequent and longer vacations. Another explanation may be that the man in the large city has an opportunity to consult with a doctor who is relatively a stranger. (The man one calls a friend in a metropolitan area would be classed as a mere passing acquaintance in the social life of the small community.) The physician in the smaller community hesitates to consult a local colleague because, as mentioned before, he lives in a glass house. He must conceal his illness and camouflage his fatigue. Further, the family physician in the smaller community has an abiding loyalty and sense of obligation to his patients. The vacation he plans is so often put off year after year because of a maternity case or any one of a myriad of circumstances. The years fly by and suddenly heart disease, today's "captain of the men of death," bars the way. The vacation is never taken.

Specialist and Family Physician Compared.—The specialist has another advantage in working by appointment and seeing a restricted range of diagnostic problems. This surely makes for less nervous strain. The number of patients that the family physician must see and the variety of diagnostic problems results in a nervous strain that is peculiar to this type of practice. For one-half day each week, I practice as specialist. For years, I have reserved one morning each week for maternity patients whom I see by appointment. If you don't do so now, I suggest that you try it. The marked reduction in nervous strain in seeing only one type of patient and the more or less leisurely schedule that allows one to sit down and talk with the patients unhurriedly and to examine them as you feel that you should is almost as relaxing as a day off.

Factors Related to Heart Disease

Nervous Strain.—Nervous strain may well be a factor in the higher heart disease mortality of physicians as compared to their counterpart in the general population, and for the family physician as compared with the specialist. It is interesting to note here that Dublin and Spiegleman found that internists and pediatricians were the only groups who had better mortality figures for heart disease than that for all physicians and that surgeons had as poor a record as the average for all physicians. Nervous tension (fig. 2) is doubtless an occupational hazard of our profession. I cannot imagine caring for the desperately ill without worrying. If I were ill, I would certainly want the physician

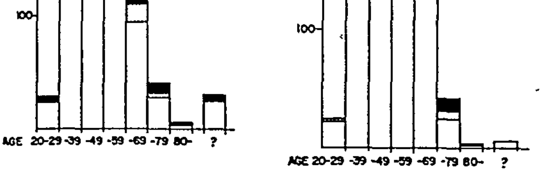


Fig. 1.—Results of electrocardiogram tracings (*left*) in 1,017 physicians in 1956 and (*right*) in 992 in 1957.

who treated me to be a bit worried. But the lack of adequate vacations is inexcusable (fig. 3). It is the result of poor planning or perhaps a very human failing of feeling indispensable. Adequate vacations would compensate to some degree for the nervous strain under which we must work.

Fig. 3.—Vacation is postponed.

Daily Exercise.—Another possible explanation for the poor record of physicians as far as heart disease is concerned is the lack of daily physical exercise. None of us is so naive as to think that the family physician has opportunity for any regular physical recreation. Some participate, it is true, in some type of sports or other physical recreation, but if we are honest about it, we must admit that it is sporadic and probably of doubtful benefit or perhaps even harmful. Yet, the physician, if he wishes to improve his mortality record, must secure regular daily exercise (fig. 4). How can this be done? It is not impossible if we avail ourselves of such opportunity as comes to hand. For example, if you walk up only six flights of stairs each day when you make your hospital rounds, instead of riding the elevator, you will expend approximately 9,000 foot-pounds of energy, over and above that involved in ordinary walking. This is not as much fun as a game of golf, or tennis, or handball, but these are exercises one cannot do every day. You can hike up those stairs at least once a day, seven days a week, securing that badly needed daily bout of exercise, and you will be in better shape for that game of golf when and if you get a chance to play it. Exercise and physical recreation are serious deficits in the daily lives of most physicians.

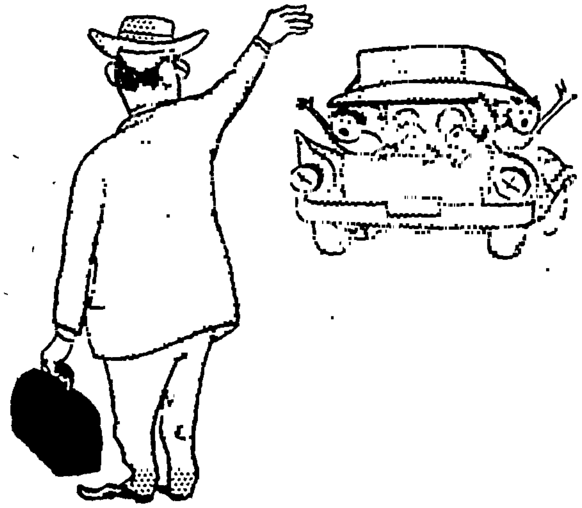


Fig. 2.—Nervous tension, an occupational hazard.

Faulty Diet and the Blood Lipids.—In recent years, considerable attention has been focused on faulty diet as one of the causes of increased death rates due to heart disease. To what extent diet is a factor in the higher mortality rate due to heart disease among physicians as compared with the general population is only speculative. The irregularity of our meals with the resultant lack of variety in available food may be significant. But we do know that the incidence of coronary thrombosis is much greater in individuals with elevated serum cholesterol levels. It is certainly prudent then for every physician to periodically check his blood cholesterol or blood lipid level and, if elevated, take steps to reduce it (fig. 5).

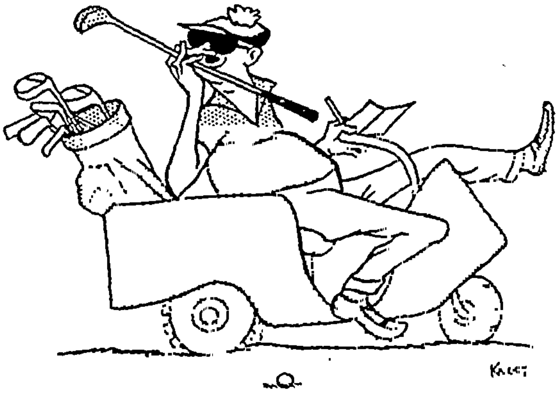


Fig. 4.—Regular daily exercise—serious deficit in lives of most physicians.

Much is said about the high fat content of our diets, but little has been said about the evil caused by concentrated carbohydrate in our foods[5] or about their possible relationship to hypercholesteremia or hyperlipidemia.[6] The prevalence of atherosclerosis in diabetics, with their deranged carbohydrate metabolism, is well known. It is common knowledge that as long as sugar is available it will be burned in the body and the fat and protein will be stored. When sugar is not available, protein and fat are oxidized to furnish the body's energy requirement. For some time I have suspected that the concentrated carbohydrates of our present day diet might be one of the factors in atherosclerosis. For that reason, when I have a patient in whom either the cholesterol or serum lipoprotein level remains elevated, in spite of the conventional low fat or low caloric diet, I place him on an extremely low carbohydrate diet (approximately 20 to 30 Gm. of carbohydrate daily). This figure can be attained not unpleasantly by placing the patient on a diet

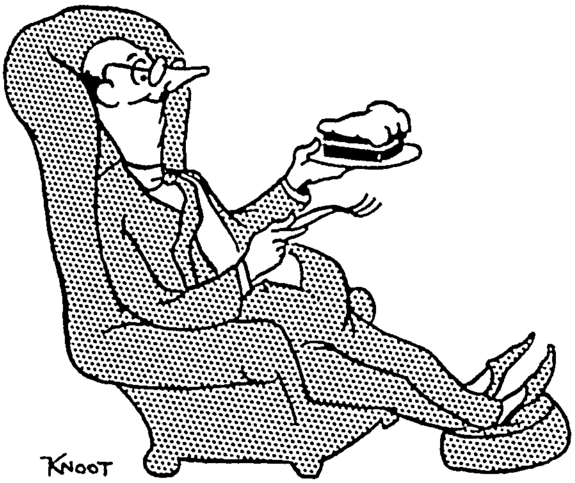


Fig. 5.—Faulty diet and high blood lipid levels.

of lean meats and vegetable salads, using a vegetable oil, such as corn oil, to make the salad dressing. In each and every case, there has been a sharp fall in the blood cholesterol level.

Figure 6 illustrates one such case. There was poor control of cholesterol level in this case, in spite of a low fat diet. The high point of 477 mg.% was taken at a time when the patient was under an emotional strain. There also had been a marked increase in the carbohydrate intake in the several weeks before the high cholesterol reading was obtained. The patient was placed on a high protein and extremely low carbohydrate diet; the result is clearly shown. There was no significant change in the fat intake. If any of you have trouble keeping blood lipid levels down on the conventional low fat diet, try this simple one. I think you will be surprised. Whatever the diet, the point that should be stressed is that physicians, too, should check the effect of diet on their own blood cholesterol level. It may be higher than you think.

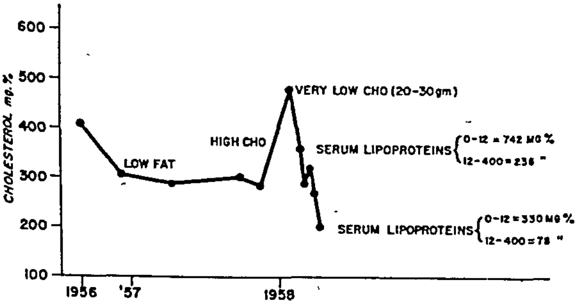


Fig. 6.—Diet and blood lipid levels.

Summary and Conclusions

The problem of heart disease is an individual one, and the solution must be worked out by each individual physician. First, establish a way of life that includes reasonable respect for your own health. Make regular daily exercise a part of your routine. If nervous tension cannot be avoided, compensate with adequate vacations. Check your diet against its effect on your weight and on your blood lipids. Finally, have a physical check-up each year. The amount of unsuspected pathology uncovered during the limited examinations we have done these past three years should convince anyone that physicians, too, should have physical check-ups. Your own self-examination should be supplemented by periodic objective examinations including electrocardiograms, x-rays of the chest and gastrointestinal system, proctoscopic examination, and such other examination as may be indicated (fig. 7).

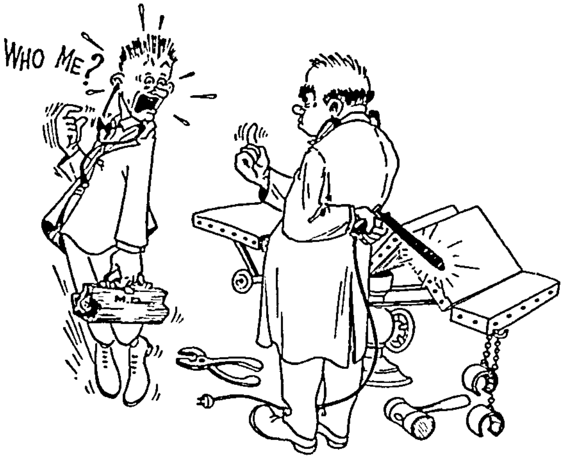


Fig. 7.—Yearly physical examination, including proctologic examination.

In conclusion, the fact that the medical profession as a group should have a poorer mortality from heart disease than their counterpart in the general population should give cause for serious reflection, for, in fact, each one of us has a physician in attendance 24 hours a day. If medical knowledge is worth anything at all, and if properly applied to ourselves, the health record of the medical profession should be far superior to that of the general population.

The life of the dedicated physician is a life of service to others. The physician today, as for untold generations, is a victim of circumstances and pressures of his calling. Some, by reason of good fortune, will have good physiques, and boundless good health will be theirs in spite of all manner of neglect. Others, because of misfortune, will die prematurely in spite of the best of care. But the majority of us will live longer and render more and better service to our fellow men if we will periodically turn our attention and skills to maintaining the physical and mental health of the physician himself.

1934 E. Fourth Ave.

References

1. Master, A. M.; Chesky, K.; and Pordy, L.: Cardiovascular Examination of 200 Practicing Physicians Over Age of Forty, New York J. Med. **51**:1713-1717 (July 15) 1951.

2. Dublin, L. I., and Spiegelman, M.: Longevity and Mortality of American Physicians, 1938-1942: Preliminary Report, J. A. M. A. **134**:1211-1215 (Aug. 9) 1947.

3. Dickinson, F. G., and Martin, L. W.: Physician Mortality, 1949-1956, Bureau of Medical Economic Research, J. A. M. A. **162**:1462-1468 (Dec. 15) 1956.

4. Dublin, L. I., and Spiegelman, M.: Mortality of Medical Specialists, 1938-1942, J. A. M. A. **137**:1519-1524 (Aug. 21) 1948.

5. Thorpe, G. L.: Treating Overweight Patients, J. A. M. A. **165**:1361-1365 (Nov. 16) 1957.

6. Gofman, J. W.: Diet in Prevention and Treatment of Myocardial Infarction, Am. J. Cardiol. **1**:271-283 (Feb.) 1958.

* * *

RESEARCH ON HUMAN FACTORS OF AERIAL WARFARE

Col. John P. Stapp (MC), U. S. A. F.

New problems of adaptation and protection for men in stressful environments have resulted from the increasing range and velocity of aircraft. Extremes of pressure, temperature, acceleration, radiation intensity, monotony, isolation, and suddenness of change are encountered in aviation and must be reproduced in the laboratory. An arduous program of research must be accomplished before manned satellites can be sent into orbit, but it is a magnificent challenge and offers the likelihood of countless unforeseeable but valuable results.

Aviation medicine had its beginning in World War I, when the airplane evolved into a fighting machine. The U. S. Army's physical examination was modified by trial and error into a flying physical examination for selecting candidates for flying training. Continued development in aircraft speed, altitude, and range, along with expansion of the Air Corps, justified special training of doctors in the selection and preventive maintenance of flying personnel: These were our first flight surgeons.

In the decade after World War I, the School of Aviation Medicine was established at Randolph Field, Texas, to train flight surgeons and to carry on research on the care of the flyer.

Emphasis was on sensory and neuromuscular adaptation to three-dimensional orientation required for flight. In the decade preceding World War II, aircraft could reach altitudes that threatened loss of consciousness from lack of oxygen and could attain velocities that offered a threat of blackout by accelerations in turning maneuvers that arrested cerebral circulation. Flight became difficult in open cockpits because of increased wind-stream pressures at higher speeds and lower temperatures at high altitudes.

These factors called for research and development to determine human requirements in the aerial environment and to provide protection from its adverse factors. For this mission, the Aero Medical Laboratory was established at Wright-Patterson Air Force Base, Ohio, in the Aeronautical Research Division of the U. S. Army Air Corps. Doctors, physiologists, and psychologists flew to observe and record the factors of the aerial environment in flight. These factors were then reproduced in ground-level simulators for controlled experiments.

The altitude chamber was designed to reproduce the decreased density of air at any given altitude above the earth. With it, animal and human reactions to decreased oxygen tension were studied extensively. Such studies made possible the development of the oxygen mask to supplement air breathing from 10,000 ft. up and to provide total oxygen requirements above 30,000 ft. This extended human performance to match aircraft altitudes. Blackout, manifested during pull-outs from dives or tight turning maneuvers at high speeds, was reproduced on the ground by the human centrifuge. This was a carousel-sized version of the laboratory centrifuge commonly used to separate corpuscles from plasma

---

Chief, Aero Medical Laboratory, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio.

Read before the Section on Military Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

by radial acceleration. A volunteer subject exposed on this device to forces identical with those encountered in airplane maneuvers experienced the same loss of peripheral and central vision, terminating in loss of consciousness when the force exceeded four and one-half times gravity for more than three seconds. This force was accurately measured in terms of the earth's gravitational field as a unit. The acceleration of gravity pulling the body downward against the resistance of the spring in a bathroom scale will register a force equal to the body weight in pounds. On the centrifuge, a 160-lb. (72.6-kg.) man will be pressed into his seat with a force equivalent to four and one-half times his body weight, or 720 lb., at blackout. By offsetting arterial hydraulic pressure pumping blood to the brain, this force deprives the retinas and cerebrum of oxygen, with consequent loss of consciousness.

Military Aviation Medicine

Early in World War II, aviation medicine expanded with the growth of military aviation. Laboratories under direction of the U. S. Navy at Bethesda, Md., and Pensacola, Fla., and of the Mayo Clinic at Rochester, Minn., made great contributions. The problems of human maintenance in aerial combat in every climate from arctic to tropics, of parachuting, land survival, and sea survival, were pursued by these laboratories. Simultaneously, they accomplished a gigantic training program to supply flight surgeons, flight nurses, technicians, and aviation physiologists to meet combat and indoctrination requirements. They contributed to one of the major achievements of aviation medicine in World War II—development of air evacuation of the sick and wounded.

Unpressurized, open-window bombers led to the development of electrically heated suits, predecessors of the familiar electrically heated blanket. Prolonged high-altitude missions introduced the problem of high-altitude bends, accelerating the development of the pressure suit. The pressurized cabin bomber removed the hazard of bends but replaced it with the no less formidable one of explosive decompression. Antigravity suits to protect fighter pilots against blackout by counter pressure to blood reservoirs in the legs and lower abdomen were invented and tested with the centrifuge.

Scarcely had the problems of piston engine aircraft been mastered when the advent of jet engine aircraft introduced an entirely new spectrum of difficulties. Foremost of these was the problem of escape, no longer possible by simply crawling out of the cockpit and parachuting down, as in the case of damaged piston engine aircraft that had to be abandoned in flight. Ejection seats, first invented by the German Air Force, were taken over at the end of World War II and perfected by the U. S. Air Force and Navy aero medical laboratories. Jet fighters rapidly attained supersonic speeds, further complicating the pilot's problem of coping with demands on his attention and reaction to flight situations. Escape had to be made fully automatic in the face of evidence that, once the protection of the canopy was removed, the dazed and buffeted escapee was helpless to discard the seat and actuate the parachute. The inexorable demands of incessantly higher and faster jet and rocket-powered aircraft were successive turnings of the screw, ever tightening the demands on human quickness, coordination, endurance, emotional stability, and tolerance to stress.

Physiology of Stress

Out of the background of medical physiology and psychology of the normal man at rest and at work, out of the physiological pathology of disease and injury, comes a new approach to meet the needs of jet and rocket age man—the physiology of stress.

Combining the techniques of physiology, physiological chemistry, biophysics, and psychology, this new field of research proposes to find in quantitative terms the limits of tolerance, adaptation, and ability to perform under stressful conditions up to the ultimate.

In the laboratories of aviation medicine maintained by the U. S. Air Force and Navy, there has arisen a unique tradition and even virtuosity of experimenting with human volunteers; they submit to painful, fatiguing, and hazardous procedures of applied research in pursuit of answers on which the lives of combat personnel will depend.

Where knowledge so obtained has vital civilian applications, as in the case of deceleration experiments on tolerance and survival of crash forces, applicable to civilian air transport and automobile safety design, such information has been made freely available to the respective industries and has been made the basis of design specifications for seats and belts.

Volunteers for hazardous experiments enjoy economic and medical protection developed within the service to cover the exigencies of combat. Indeed, the diplomatic cold war and its pressures on weapons developments becomes a hot war in the laboratories, where lives are risked in research on human factors of aerial welfare.

Space Medicine

Gradually, and with little premeditation, aviation medicine research has laid the groundwork for space medicine. Most of the problems of space medicine are but extensions of the same problems of aviation into space dimensions. Projecting from the brief exposures to acceleration endured in airplane maneuvers, seconds of exposure turn to minutes of high acceleration during the stages of space missile propulsion to attain fantastic velocities for going into orbit or for escaping from the earth's gravitational pull.

The centrifuge, which in the days of airplane research exposed volunteers to seconds of blackout acceleration, is now called on to spin them for minutes of rocket acceleration at even higher decelerative forces, which can only be withstood by presenting the body in a semirecumbent position on a bed-like, flattened contour chair, at right angles to the line of force, from front to back.

With finger controls, the subject, his arms immovable from the pressure of 8 G, is able to maintain a dot on a crosshair target for more than two minutes. Only at 12 G, in this favorable position, does he black out as blood is pushed back from the retinas.

Reentry into the earth's atmosphere from orbiting flight might require many minutes of exposure to decelerations of aircraft blackout magnitude. On the centrifuge, human volunteers have withstood 3 G for one hour in the transverse, semirecumbent position. If this were a constant vertical acceleration at 3 G for one hour, the final velocity would exceed 200,000 mph, or eight times the speed required to escape the earth's gravitational field. At 4 G, the centrifuge exposure could be tolerated for less than an hour because of uncomfortable effect in breathing.

One problem defies ground level simulation. Entry into orbital flight relieves the body of all accelerative force. The rate of turn in the orbital ellipse exactly equals and is opposite to the acceleration of gravity, so that the capsule and its occupant are in a weightless state.

On the ground, underwater flotation of the body allows limited imitation of weightlessness, useful in certain neuropsychiatric experiments. Only by taking a fast jet aircraft up to 30,000 ft. and putting it through a combination shallow outside loop and dive, where the combination of radial acceleration and rate of descent can be made equal and opposite to the earth's gravitational pull for 30 seconds or less, can a brief exposure to weightlessness be obtained.

The acceleration of several G required to enter and exit from this maneuver make it impossible to discriminate effects of true weightlessness from the effects of changing gravitational climate. Indications are obtained, however, of subjective and objective alterations of reflex sensations and responses, of adaptations in orientation and equilibration without a gravity reference.

Motion pictures have been made of the comical efforts of subjects to eat and drink in the weightless state. Fluids float in the air in globules that defy corralling; food floats between the tongue and the palate. What was at first considered a significant increase in nausea and vomiting, comparable to airsickness in ordinary flight, turned out to be vomiting and nausea: the subject felt food floating up the esophagus from peristaltic contractions with a relaxed cardiac valve during weightlessness, which set up a vomiting reflex when the bolus reached the pharynx. A purse-string suture around the cardiac sphincter is hardly the answer for this problem.

A more sinister problem is hinted at in an observed decrease in blackout tolerance after the 30 seconds or less of weightlessness. A 4.5-G pull-out at the end of the zero gravity aircraft maneuver resulted in blackout of several times the duration experienced by the same subject after the same pull-out not preceded by exposure to zero gravity. What would abrupt exposure to violent decelerations during reentry maneuvers do to a space pilot with thresholds to acceleration diminished by several hours of adjustment to weightless orbital flight in a capsule, with circulation adjusted to decreased muscle tonus resulting from deprivation of proprioceptive and antigravity reflexes?

This question can only be answered by the first animal and human orbital experiments with successful reentry. The only antigravity machines encountered at ground level are found in the comic sections of the newspapers. They have the advantage of many years dedicated to levity.

Two other factors might have consequences vital to survival in the first manned space flight: deprivation of normal sensory stimuli to which the space pilot is accustomed on earth and isolated confinement in this close-fitting capsule in the darkness and quietness of outer space. Numerous ground simulation experiments have been carried out and are in progress to evaluate human reactions to such conditions. Even the near vacuum of 200 miles above the earth has been reproduced in a chamber on the ground by evacuating it until it is less dense than the contents of a radio vacuum tube. This space altitude chamber aids in the development of pressure suits able to contain viable pressures in case a space pilot must abandon his capsule 200 miles above the earth.

The most definitive human experiments to date on exposure to space equivalent conditions have been accomplished by the U. S. Air Force and the U. S. Navy with helium-filled, plastic, free balloons carrying manned capsules above the stratosphere. At 102,000 ft., the highest altitude thus attained to date, the capsule is above 99.0% of the earth's atmosphere and, essentially, total solar radiation is experienced in the practically nonconducting remainder. Thus, temperatures above boiling on the sunny side of the capsule were measured at the same time temperatures 100 degrees below freezing prevailed on the shady side. Total ultraviolet content of the sunlight, unfiltered by the earth's atmosphere, would make exposure outside the capsule quickly unendurable. At this height the earth's gravitational field is only diminished 1%; therefore, weightlessness played no part in this experiment.

These experiments demonstrate the usefulness of a space platform 20 or more miles up that can remain aloft more than 24 hours with occupants able to maintain themselves and make useful scientific observations.

Conclusions

Long before the first manned missile hurtles into the heavens seeking an orbital path, a long program of arduous, tedious research with the usual quota of trials and errors, of failures and breakthroughs, must be accomplished. Homo sapiens is not going to be converted into "homo spaciens" overnight.

Something more than curiosity, something more than fear of being outrun in the cold war, something more than the foreseeable economic and scientific returns of space flight motivates man into this unknown, toward unpredictable results and unforeseeable consequences. Perhaps when the first man returns from the first successful flight into space, he may find words to tell us how our world looks from his unique point of view. Human progress is marked by increments of objectivity and of projection. What more challenging increment of human outlook than to see our world from the viewpoint of the universe!

PSYCHIATRIC PROBLEMS AND PREFERENCES FOR INSTRUCTION

AN APPRAISAL OF REPORTS BY THREE HUNDRED THIRTY-EIGHT GENERAL PRACTITIONERS

Cecil L. Wittson, M.D., LaVerne C. Strough, M.D.
and
Jackson A. Smith, M.D., Omaha

The interests of nonpsychiatrist physicians in various aspects of psychiatry and their attitudes toward psychiatrists were studied by a questionnaire method, with responses from 338 nonpsychiatrists. In addition, the literature was surveyed for publications on the subject of postgraduate courses in psychiatry for general practitioners. The purpose was to plan more satisfactory courses of this kind and in general to improve the cooperation between nonpsychiatrists and psychiatrists in the management of emotional illness. The results of the study showed that communication between the two groups was not altogether satisfactory. General practitioners varied markedly as to the frequency with which they encountered or recognized psychiatric problems. They were not so much interested in questions in referral as in medical and physical therapy. As to courses of instruction, their preferences were for clinical representations with adequate emphasis on neurology.

In order to more satisfactorily plan postgraduate courses in psychiatry for general practitioners and other nonpsychiatrists, a survey of the literature in this field since 1950 was made and a questionnaire was mailed to over 1,200 practicing physicians to determine their interests.

Review of the Literature

The survey of the literature revealed the majority of the reports were written by psychiatrists; the following points were stressed as problems of major importance for the general practitioner in the management of these patients: a reluctance to accept emotional illness as being primarily a medical disturbance, the existence of similar problems in the patient and the physician, and difficulties in diagnosis. The needs for a more adequate and complete history and more satisfactory methods of referral were emphasized.

This problem of referral by the generalist to a psychiatrist was discussed in several papers. Factors influencing referral but not sufficiently emphasized were (1) the patient's (and the public's) concept of a psychiatrist, (2) a lack of understanding of psychiatric terminology in consultation notes and in case presentations, and (3) the general practitioner's attitude about psychiatry.

The first of these factors, the patient's concept of a psychiatrist, is detailed by Bingham.[1] She pointed out that "though a resident of New York City until

---

From the Nebraska Psychiatric Institute and the Department of Neurology and Psychiatry, University of Nebraska College of Medicine.

Read before the Section on Nervous and Mental Diseases at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

three years ago, I had not only never met a psychiatrist, but I had never met anybody who had met a psychiatrist." She makes the plea that the psychiatrist present himself to the public as a human being who is occasionally baffled by his children and is capable of error, and not an omnipotent, all-knowing person from whom nothing can be concealed.

Second, the problems in communication between psychiatrist and nonpsychiatrist are manifest in the complaint of the general practitioner that he either does not understand the psychiatrist's report or that the report fails to inform him on how to proceed in the management of the patient.

Appel[2] has described a few trends in psychiatric training which may account for some of this difficulty. He points out that "much psychiatric thinking is removed from the readily observable and confirmable to the theoretical" and that "one observes more emphasis on dynamics and increased facility in speculation." Perhaps a major factor has been the tendency for patient examination, case conferences, and formulations to become what Appel describes as "stream of consciousness reports, a la Gertrude Stein or James Joyce." Hypotheses may be asserted as facts or terminology be taken for explanation. Consequently, the general practitioner attempting to explain psychiatric illness, treatment, and prognosis to anxious relatives may be as much perplexed as enlightened by a psychiatric report of the type Appel describes.

The third factor which may influence referral is the general practitioner's attitude about psychiatry. A stimulating report[3] of a panel discussion on this subject merits consideration. The panel was composed of three general practitioners and two psychiatrists.

The generalist's feelings (which might be called negative) about the psychiatrist's frequent refusal of professional courtesy were discussed with some affect. The lack of help or direction the nonpsychiatrist receives with such problems as duodenal ulcer and ulcerative colitis, and the lack of results seen when consultation was requested for such patients, was mentioned. The psychiatrists replied that, in somatic illness where organic change has occurred, the results of psychotherapy were often poor or nebulous and, for this reason, the psychiatrist was unwilling to undertake a long course of treatment which would be expensive to the patient. The general practitioners felt that, as a physician, the psychiatrist should never "throw up his hands" even though the condition was not alterable and that an obligation existed to help the patient live better with his disease.

The point was made, with emphasis, that the general practitioner does not know psychiatrists as individuals, because during residency training they are in a separate building and, when the generalist begins practice, he sees other specialists at lunch, at clinical pathological conferences, and on rounds but he does not see psychiatrists.

The implication was that the psychiatrist was professionally and socially isolated from the nonpsychiatric physician after his internship. The psychiatrists on the panel pointed out that the time required to do psychotherapy was extensive, that no methods were available to offer "quick relief," and that "the tools which we have to work with are limited." The general practitioners' reply was that 60 years ago all physicians' tools were limited but advances had been made.

Although this panel discussion was refreshingly lacking in agreement, and everyone had an opportunity to express his opinion or bias, the feelings expressed by the participating general practitioners would certainly merit consideration by those planning postgraduate courses.

There was general accord in the papers surveyed that the emotionally ill or those with organic illness complicated by emotional factors made up a sizable proportion of all those patients seen in general practice. There was also accord that psychotherapy with the somatically ill was primarily the responsibility of the physician treating the patient for his somatic illness.

Hyde gives an excellent description of the problems the general practitioners may face in the diagnosis and treatment of the mentally ill, based on his own experience in practice. He stated, "Twenty years of seeing the problems of one's patients bring about a richness of perception and understanding that perhaps cannot be equalled by any other system."

Methods of Survey

To determine the interests and preferences of nonpsychiatrists in postgraduate courses in psychiatry, a questionnaire was sent to over 1,200 practicing physicians. This questionnaire contained 21 items to be checked by the physician and was sent by first class mail with an explanatory letter. The questionnaire, a stamped envelope with a return address for use in returning the form, and the explanatory letter were mailed in a folder bearing a University of Nebraska letterhead.

To determine whether those who did not reply failed to do so for a lack of interest in the subject, 40 physicians who did not answer were selected at random and a second letter and the same questionnaires were mailed to this group. The second letter emphasized the importance of their cooperation in the satisfactory completion of the study rather than their interest in postgraduate courses in psychiatry.

Of the responding physicians, less than 2% limited their practice to psychiatry and neurology, while 72% were in general practice and 25% were in other specialties (a few respondents made no indication of type of practice).

Results of Survey

Three hundred twelve physicians returned the first questionnaire; 26 of the 40 who were sampled in the second mailing responded. Apparently they were twice as interested in helping with the study as in postgraduate courses in psychiatry.

In the following data, the differences between the percentages given and 100% were those who left the question blank or checked both possibilities. In the results of the questions as to preference for type of presentation, speakers, clinical material, and method of presentation, 66% preferred a clinical type, 50% preferred local to nationally known speakers, 66% preferred a discussion of case material from the institution where the course was given to a presentation of the speaker's own cases, and 60% preferred several cases briefly presented to one case in detail.

On the questions pertaining to the physician's area of interest (table 1), blanks were provided to allow the respondent to qualify his interest in a given area as "much," "some," "little," or "not at all." The major interest in physical and drug therapy was anticipated, due to the present epidemic of "lost tranquility" and the enduring hope for a rapid method of management.

TABLE 1.—*Physicians' Areas of Interest*

	Degree of Interest, %				Space Left Blank, %
Topic	Much	Some	Little	Not at All	
Physical and drug therapy	66.86	19.82	6.80	0.89	5.63
Diagnosis	60.06	26.92	5.32	2.38	5.32
Psychiatric aspects of family counseling	52.52	27.00	10.09	5.34	5.05
Causes	50.89	28.41	10.65	3.25	6.80
Psychotherapy	45.99	30.56	13.95	1.78	7.72
Neuropsychiatric outpatients	42.90	33.43	11.54	5.92	6.21
Community mental health programs	27.81	30.77	21.79	10.36	9.27
Legal problems in psychiatry	27.51	29.39	21.89	10.56	10.65
Commitment procedures	26.92	27.81	20.42	13.31	11.54
Hospitalized neuropsychiatric patients	7.39	29.29	34.62	16.87	11.83
Referral problems	6.33	44.72	23.21	13.08	12.66

However, it was not anticipated that diagnosis, family counseling, and etiology (causes) would be of more interest than psychotherapy, which is regularly presented as a factor in all types of treatment. The awareness of the importance of family counseling and the acceptance of this activity as a medical responsibility was encouraging. The area of least interest, "referral problems," is emphasized; it was previously mentioned that this was a frequently discussed problem in the literature in this area. Apparently, the nonpsychiatrist has had sufficient instruction on this subject or in any event is not particularly interested in having more.

Results in the third category, frequency of psychiatric problems in practice (table 2), are somewhat unusual, because 38% of those responding saw psychiatric problems in 17% or less of their patients; at the other extreme, 17% saw psychiatric problems in 88 to 100% of their patients. It would seem rather improbable that the patients who compose the practice of the respondents would vary to this degree. It seems more likely that there is little accord as to what constitutes psychiatric problems or that the criteria for such a diagnosis vary rather widely.

Table 3 reveals that only one-fourth of those replying had a marked interest in postgraduate courses in psychiatry but 77% stated they would attend such courses if they found them interesting. Having to travel to a central point to attend such courses was not seen as a handicap, since only 67% were interested in a live two-way broadcast which they could hear locally.

TABLE 2.—*Frequency of Psychiatric Problems in Practice*

Patients Seen with Psychiatric Problems, %	Respondents, %	
0-7	18.64	38.46
8-17	19.82	
18-27	13.91	
28-37	7.69	
38-47	3.55	
48-57	9.76	
58-67	2.96	
68-77	5.31	
78-87	0.90	
88-100	17.46	

The last three replies were somewhat surprising, since a bare 3% preferred courses which emphasized only psychiatry, whereas 12 times as many preferred courses which emphasized only neurology. The majority preferred an emphasis on both subjects.

Comment

The literature reviewed was more an expression of the psychiatrist's view of the general practitioner's problems than opinion of what the general practitioner thought he needed. One report[3] of a panel discussion between generalists and psychiatrists was refreshing in the candor and content of the opinions expressed.

The 338 replies in the survey showed the nonpsychiatrist's interest in somatic and drug treatment procedures and a disturbing 97% lacking interest in courses limited to psychiatry. From the replies, it appears the generalist appreciates the needs of family counseling but has little interest in hearing more about the problems of referral.

The problems of communication between psychiatrists and nonpsychiatrists would appear an area to be considered by those planning postgraduate courses. Although descriptive psychiatry has not been fashionable for some time, a clarification of the signs and symptoms by which those who are emotionally ill may be recognized (as well as the dynamics of their particular case) might make communication less a problem.

TABLE 3.—*Physicians' Interest in Postgraduate Courses*

Degree of Interest	Respondents, %
Marked	25.29
Moderate	43.60
Mild	15.98
Slight	4.44
None	2.66
Blank	5.33
Would attend interesting course	76.92
Two-way broadcast	67.46
Emphasis of course	
Psychiatry	3.16
Neurology and psychiatry	59.49
Neurology	36.71

Summary

On the basis of 338 replies to a questionnaire, the following preferences and interests of nonpsychiatrists were determined: General practitioners preferred clinical presentations, local speakers, a presentation of patients from the institution where the course was given, and several cases briefly presented. Their greatest interest was in physical and drug therapy; they were least interested in problems of referral.

A marked discrepancy in the frequency with which psychiatric problems were seen in their practices was reported; 38% saw such problems in less than 17% whereas 17% saw the same problems in more than 88% of their patients.

Only one-fourth of the physicians who replied checked a marked interest in postgraduate courses in psychiatry, although 77% would attend if such courses were interesting. Ninety-seven per cent did not prefer courses with an emphasis only on psychiatry.

602 S. 44th Ave. (5) (Dr. Smith).

This study was supported in part by the Nebraska State Department of Health and the Board of Control Psychiatric Research Fund.

References

1. Bingham, J.: What Public Thinks of Psychiatry, Am. J. Psychiat. **107**:599-601 (Feb.) 1951.
2. Appel, K.: American Board of Psychiatry and Neurology—Some Reflections, J. M. Educ. **31**:359-364 (June) 1956.
3. What General Practitioners Think About Psychiatry, M. Times **85**:467-474 (April) 1957.

WHIPLASH INJURIES

NEUROPHYSIOLOGICAL BASIS FOR PAIN AND METHODS USED FOR REHABILITATION

Emil Seletz, M.D., Beverly Hills, Calif.

The collision of automobiles generally results in either acute flexion or severe hyperextension of the passenger's neck, depending on the direction of the impact. Direct trauma results to the spinal accessory nerve and to the roots of the cervical nerves, but in addition there are vasomotor disturbances resulting indirectly from damage to the vertebral arteries and to nerve fibers that accompany these arteries in their course through the foramina transversaria. The result is a varied syndrome of neurological and neurovascular troubles. Treatment with tranquilizers and psychotherapy is of no avail, and patients become discouraged and resentful. The procedure here outlined includes heat, manipulation, and traction. Carefully adapted to the individual case, this plan generally obviates the danger of surgical and psychiatric complications and often leads to prompt rehabilitation of the patient.

Our present industrial civilization religiously follows the creed to serve only youth and its irresponsibility. There is no way to avoid the ever-increasing incidence of whiplash injury. It is not within the realm of the physician to even talk of the prevention of these injuries, since the basic goal of our mechanical progress is to increase the "force of thrust," accelerate speed, and achieve absolute automation. The only way to protect man against his inventive genius is to encase him in stainless steel armor, which is more fitting today than in the days of King Arthur.

In order to properly help with this problem we must change our basic concept of this injury, for it is not a direct injury only to bony architecture and soft muscle structures. While, occasionally, after whiplash injuries to the cervical spine, the x-rays may reveal injuries to bones or joints with possible dislocation or subluxation, the disabling and persistent symptomatology in the vast majority of cases is due to involvement of the delicate and vital nerves and blood vessels about the cervical spine.

A varied and complex neurological and neurovascular syndrome so consistently follows the major type of neck sprain as to constitute a definite syndrome. Since a great percentage of the symptoms are referred to and arise from disturbance of the central nervous system, I have chosen to name this the "craniocervical syndrome." [1]

Read before the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

Since the x-ray findings in this syndrome usually splay no bony injury, many of these patients are cused of having functional disorders and eventu-ly go to psychiatrists instead of to those expertly ained in physical medicine and rehabilitation, who operly should treat these patients.

The purpose of the present communication is two-ld: (1) to determine the neurophysiological basis r the pain and disability; and (2) to stress the portance of effective methods used for rehabilita-on.

The origin of the pain and disturbed function es in the involvement of various cervical nerve ots, the spinal accessory nerve and the cervical utonomic nerve, including the vertebral nerve, and the transient obstruction or compression of the ertebral artery.

he Role of Cervical Nerve Roots in Producing Pain and Headache

A major portion of the headaches associated with is syndrome are derived from traction injury to he second cervical nerve root. The second cervical nerve root is especially vulnerable to injury, since, in its peculiar anatomy, it is not protected by pedicles and facets,[2] as are all the other nerve roots in the vertebral spine (fig. 1); in addition, the point of exit of the second cervical nerve is between the atlas and the axis—the point of greatest rotation of the head on the neck.[3]

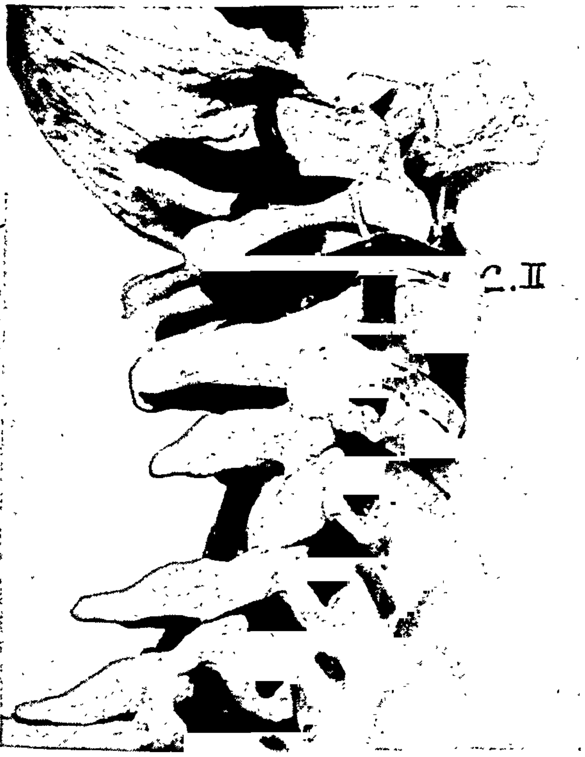


Fig. 1.—Second cervical nerve root, not protected posteriorly by pedicles and facets.

It will be remembered that the second cervical nerve continues as the great occipital nerve, which supplies the cutaneous distribution to the major portion of the scalp, the side of the neck, and portions of the face (fig. 2). In addition, the physiological communication between the second cervical and the trigeminal nerves in the spinal fifth tract of the medulla (fig. 3) involves the first division of the trigeminal nerve and thereby gives rise to attacks of hemicrania with pain radiating behind the corresponding eye.[4] This is the mechanism whereby a great many chronic and persistent headaches have their true origin in injury to the second cervical nerve, and, as I emphasized in a recent communication, "Many headaches are not headaches at all, but really a pain in the neck."[4A]

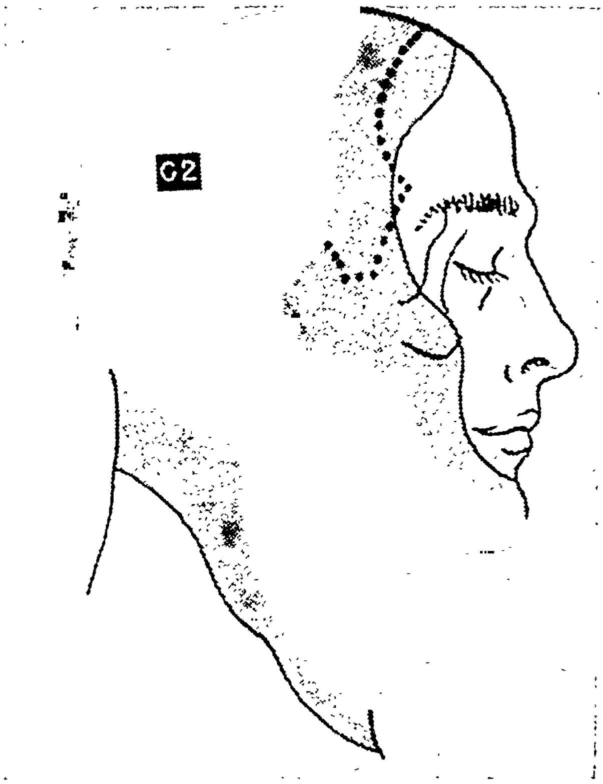


Fig. 2.—Cutaneous distribution of C-2 (reproduced with permission of Williams & Wilkins Company).

The disturbance of the great occipital nerve (C-2) is further aggravated by spasm of the trapezius muscle, since traction is thereby exerted on the nerve as it pierces the tendinous attachment of the muscle to the base of the skull.

Persistent Muscle Spasm

As previously recorded,[1] in reviewing the anatomy of the spinal accessory nerve, its major origin is by filaments from the entire length of the cervical spinal cord. From its origin, the nerve ascends through the foramen magnum and leaves the skull through the jugular foramen for a long descent to the trapezius muscle (fig. 4). The persistent spasm of the trapezius and sternomastoid muscles is due, therefore, not to primary injury to the muscles but to traction injury to the delicate filaments of origin of the spinal accessory nerve.

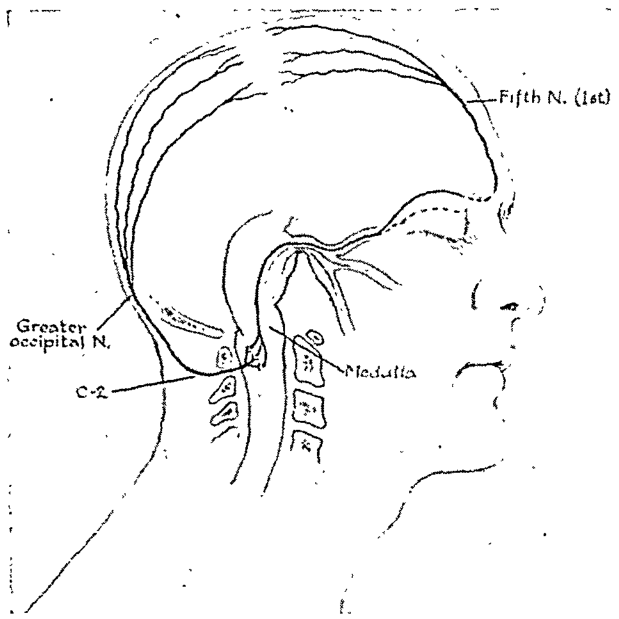


Fig. 3.—Synapse between the great occipital and trigeminal nerves (modified from Skillern[4]).

Nerve Root Irritation in the Intervertebral *Foramina*

A number of physicians have come to dislike the phrase "whiplash injury" and are critical of its use. One of my orthopedic friends calls "whiplash injury" a "wastebasket term." To him I say: "Please remove the term from your wastebasket to a place of prominence on your mahogany desk." Let us now, therefore, consider the mechanics of injury and justify the use of the terminology.

J. T. McLaughlin has shown that when a 3,500-lb. car traveling at 10 m.p.h. strikes the rear of another car it may transmit to this car a force of 25 tons. The person's body (in the car that is struck) continues to move forward, while the head, being hinged at the neck, snaps backward. The average head weighs about 8 lb., and the cervical vertebrae are very delicate; the force that is pushing the head backward is even greater than believed, since the base of the neck acts as a fulcrum and the leverage is applied near the top of the head. Therefore, the head snaps back with the equivalent of several tons of force—without any support, since "the muscular control of the neck is caught off guard."[3] The end-result, with the neck in acute hyperextension, is a momentary posterior subluxation of the various joints with fleeting narrowing of the foramina, so that the nerve root is caught in a pinchers between the superior and inferior facets.

The head now snaps back in acute flexion—a true "whip-snap" (Mark Twain's Tom Sawyer and Huck Finn used this method in killing snakes and referred to it as the whip-snap). X-rays after this type of injury usually reveal no evidence of disturbed ment, but what about the traumatized Careful neurological testing soon after the injury veals not pain but hypalgesia or anesthesia distribution *of one or more* nerves, since the ne is temporarily put out of function by the The pain and muscle spasm appear later, with ginning recovery of nerve function. During hemorrhage within the capsular ligaments giv to swelling of the nerves and eventually between the dural sleeve and the nerve root; factors give rise to symptoms that may b longed for months or even years after the

Other nerves involved are the spinal already mentioned, the sympathetic trunk, vertebral. The vertebral nerve lies within the verse foramina and travels alongside the artery. The vertebral nerve originates stellate ganglion and supplies the vertebral ilar vessels. Injury to this nerve produces the vertebral arteries and gives rise to circulation to the pons and portions of the containing the nuclei of origin of the lower cranial nerves, with resultant far-flung sym

Foraminal Encroachment

While the acute *symptoms* depend on the and severity of injury, the late symptoms are determined by the peculiarly individual of the cervical spine.[5] The cervical vertebrae course, proportionately smaller than those in parts of the spine. In addition, the disk porti even smaller in their relative sizes, because on side the space is occupied by special synovial

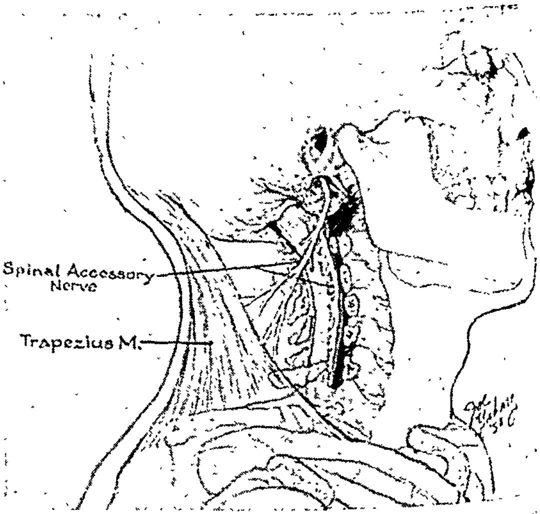
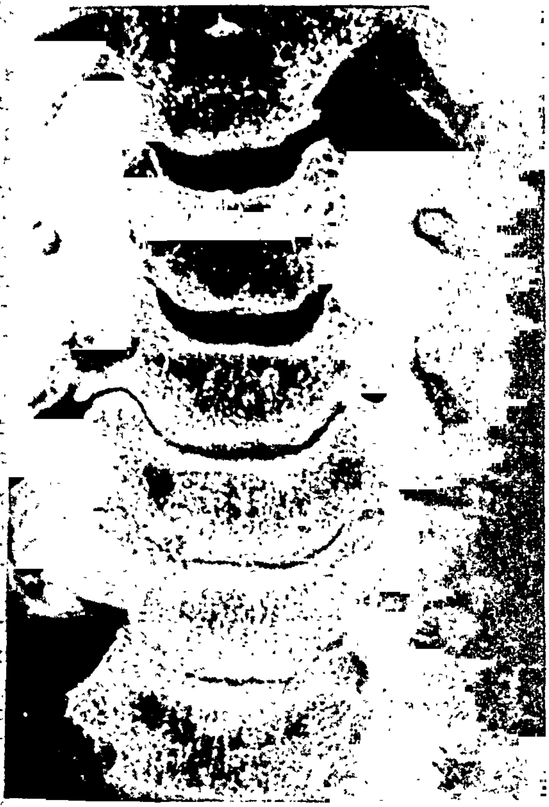


Fig. 4.—Spinal accessory nerve, with origin on ent length of cervical spinal cord. After entering skull, ner exits through jugular foramen for long descent to trapez muscles.

not present in other parts of the spine.[6] Althou described in 1858 by von Luschka, they are rar given proper attention because of their misleadi diminutive proportion, but the role played by the is most significant.

ith degenerative thinning of the disk after trau- he processes of the lateral joints are gradually d outward and laterally, resulting in osteophyte ation (fig. 5).

hen the spurs project laterally, they compress ntervertebral nerve root in the foramen; when project forward, they encroach on the verte-



ig. 5.—Osteophytes, resulting from degenerative thinning isk after trauma, with lateral joints forced outward (re- luced with permission of Charles C Thomas, Publisher).

l artery and nerve[7] within the foramen trans-sarium (fig. 6). These spurs project even more, ce the osteophytes are capped with cartilage l are considerably larger than is revealed by the ntgenogram.[8]

t will further be remembered that, while the cervi- foramina appear relatively large on the x-ray ture, they are partitioned by the structures not ible by x-ray, passing through the foramen trans-rsarium, namely, the vertebral artery, veins, and rve. When the gross specimen of the cervical ne is viewed obliquely, with the vertebral artery place, it is seen that three-fourths of the lateral meters of the foramina are occupied by these uctures.

Vertebral Artery Compression

In reviewing the anatomy of the vertebral artery, will be remembered that, after its origin from the bclavian artery, it passes through the foramina ansversaria of the lower six cervical transverse ocesses. After passing through the foramen trans-rsarium of the atlas, the artery turns very sharply medially and, after piercing the thick membrane between the atlas and the occipital bone, enters the cranial cavity through the formen magnum.

Very little slack exists in the vertebral artery (fig. 7), and, during severe hyperextension and hyperflexion and especially during extreme lateral rotation, partial to complete obstruction of the vertebral artery has been demonstrated by arteriography. The vertebral artery is the pipeline carrying blood and oxygen to the brain stem, just as is the oxygen tube to the deep-sea diver.

Lewis and Coburn[9] have demonstrated by angiography constriction or occlusion of the vertebral artery in patients in whom symptoms of vertigo, ataxia, headache, diplopia, and unsteadiness of gait have persisted. The usual site of occlusion is at the second cervical level, which is the point of greatest rotation of the head on the neck.

Ford[10] describes the case of a 17-year-old boy who developed attacks of syncope followed by vertigo, unsteadiness, nystagmus, and diplopia when his head was placed in hyperextension. It was determined in this case that posterior displacement of the axis, due to excessive mobility of the second cervical spine, would produce transient obstruction to the vertebral artery. Surgical fusion and mobilization gave complete cure.

Others have observed complete obstruction in the vertebral artery during angiography in cadavers when the head is rotated to either the right or the left. A great majority of symptoms that have been designated as psychoneurotic, namely, attacks of vertigo, ataxia, diplopia, severe attacks of migraine-like headache, hemicrania with nausea and vomiting, and, at times, disturbance of speech and swallowing, are all due to disturbed circulation of the vertebral artery after neck sprain.

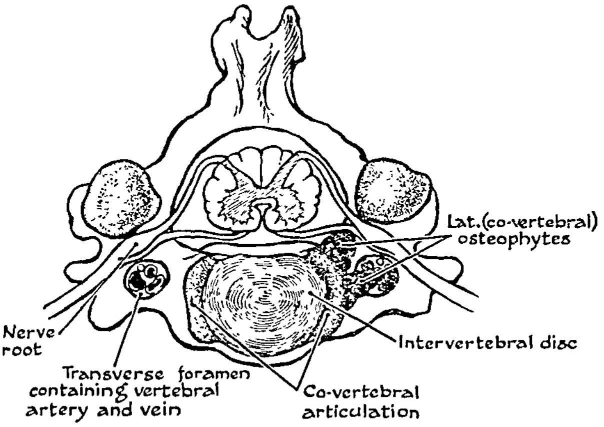

Lat.(co-vertebral) osteophytes
Nerve root
Intervertebral disc
Transverse foramen containing vertebral artery and vein
Co-vertebral articulation

Fig. 6.—Compression of intervertebral nerve and/or vertebral artery by lateral (covertebral) spurs (modified from Neuwirth, *New York J. Med.* **54:**2583, 1954).

Treatment

Physical therapy originated in antiquity and was certainly highly specialized during the inception of the Olympic games in the Hellenic Era. There are many ancient Greek statues and friezes depicting the physiotherapy measures being administered to athletes.

Circulation in the major blood vessels is propelled by the force of the pump (the heart). Circulation in the capillaries and the lymph channels within the body tissues depends on normal muscle tone and the intrinsic vasomotor homeostasis.

If the blood vessel wall has been traumatized during the injury or the vertebral nerve has been injured, vasospasm persists. The only true, effective measures for tiding over this stage of injury lie in adequate physical therapy.

Treatment must be started early and must be administered by those expertly trained in physical therapy and rehabilitation. The attempt is often made to give physical therapy in a doctor's office, consisting in the application of heat from a heat lamp or diathermy machine, as described by Krusen and Ford[11]: Those patients not receiving adequate therapy will not improve and will soon become discouraged and resentful.

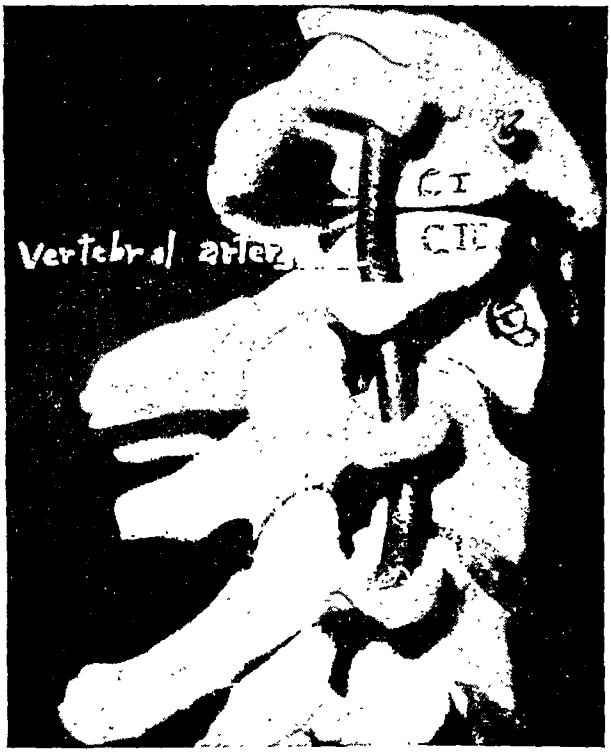


Fig. 7.—Vertebral artery.

Because of continued complaints, many of these patients finally see a psychiatrist. The couch would serve a better purpose in this instance if it were equipped with a traction apparatus and supplemented by a gentle massage. The fault, however, is not with the psychiatrist but with the referring physician. In reviewing the types of treatment with a number of specialists in this field, it is found that, while therapy naturally varies to suit the individual need, it consists primarily of local heat in the form of hot wet packs and cervical traction, followed by very gentle massage and manual rotation. When the radicular pain is severe, occasionally a local anesthetic should be injected to the most painful area, usually at the point of attachment of the trapezius muscle to the base of the skull and including the adjacent region where the great occipital nerve reaches the subcutaneous tissue.

Local hot packs relieve the muscle spasm, increase the circulation, and frequently stop severe occipital pain and headaches. The importance of a carefully planned scheme of treatment must b emphasized to the patient, and treatments must b religiously carried out daily during the first tw or three weeks (and then about three times weekly depending, of course, on the individual case. Dela or faulty treatment leads to adhesions about th facets and scarring about the capsular ligament persistent spasm, congestive lymph edema, an fibrosis of muscles, swelling, and eventual adhesion of nerves within the nerve root canals.

The resultant faulty posture in neglected case enhances the degeneration of the intervertebr disks, as well as spur formation in the lateral c vertebral articulations, which in the roentgenogra has come to be known as traumatic arthritis. I ca not too strongly emphasize the urgency of ear and persistent therapy, always by a specialist this field. By reviewing the anatomy of the cervic vertebrae and its articulations it can more readi be appreciated how injurious faulty traction traction applied by the patient can be. Jacks says, "Woe unto the doctor who hands the patie the traction apparatus and tells him to go hon and get in it."[6]

Traction serves many functions. It relieves mu cle spasm, helps to immobilize the spine, straighte the cervical spine, and enlarges the intervertebr foramina. Especially, I wish to emphasize the in portance of traction in helping to relieve obstru tion to the course of the vertebral arteries. Jackso believes that early and adequate traction may pr vent the formation of adhesions between the dur sleeve of the nerve roots and the adjacent stru tures. She has also found most valuable the u of the contour pillow, which gives excellent suppo to the neck structures during rest and sleep.

In severe spasms of the cervical spine, a ligh weight collar which maintains the neck in prop position, "with chin tucked in" and avoidance hyperextension, may be used. (Faulty postu traumatizes the cartilaginous surfaces.) Judicio use of muscle-relaxant drugs is beneficial to son patients. I personally resent the extensive use the so-called tranquilizing drugs in this type case, the sole purpose of which is to confuse th mind so that the patient will not complain.

Occasionally, a patient is seen with persiste complaints of head, neck, and shoulder pain, wh in spite of normal findings on opaque myelograph has had on surgical exposure persistent swellin and adhesions of several nerve roots within th dural sleeve of exit. It is most likely that earl persistent, and adequate therapy by those expertly trained in physical medicine will prevent most patients from developing a surgical condition.

405 N. Bedford Dr.

References

1. Seletz, E.: Craniocerebral Injuries and Postconcussion Syndrome, J. Internat. Coll. Surgeons **27**:46-53 (Jan.) 1957.

2. Hunter, C. R., and Mayfield, F. H.: Role of Upper Cervical Roots in Production of Pain in Head, Am. J. Surg. **78**:743-751 (Nov.) 1949.

3. Jackson, R.: Cervical Syndrome, Springfield, Ill., Charles C Thomas, Publisher, 1956.

4. Skillern, P. G.: Great Occipital-Trigeminus Syndrome as Revealed by Induction of Block, A. M. A. Arch. Neurol. & Psychiat. **72**:335-340 (Sept.) 1954.

4A. Seletz, E.: Headaches of Extracranial Origin, California Med., to be published.

5. Hadley, L. A.: Spine, Springfield, Ill., Charles C Thomas, Publisher, 1956.

6. Jackson, R.: Mechanism of Cervical Nerve Root Irritation, Dallis M. J. **38**:71-82 (June) 1952.

7. Neuwirth, E.: Vertebral Nerve in Posterior Cervical syndrome, correspondence, New York J. Med. **55**:1380 (May 1) 1955.

8. Hadley, L. A.: Covertebral Articulations and Cervical Foramen Encroachment, J. Bone & Joint Surg. **39-A**:910-920 (July) 1957.

9. Lewis, R. C., and Coburn, D. F.: Vertebral Artery: Its role in Upper Cervical and Head Pain, Missouri Med. **53**:1059-1063 (Dec.) 1956.

10. Ford, F. R.: Syncope, Vertigo and Disturbances of Vision Resulting from Intermittent Obstruction of Vertebral Arteries due to Defect in Odontoid Process and Excessive Mobility of Second Cervical Vertebra, Bull. Johns Hopkins Hosp. **91**:168-173 (Sept.) 1952.

11. Krusen, E. M., and Ford, D. E.: Compensation Factors in Low Back Injuries, J. A. M. A. **166**:1128-1133 (March 8) 1958.

ETIOLOGICAL FACTORS IN FIRST-DEGREE MURDER

Glen M. Duncan, M.D., Shervert H. Frazier, M.D., Edward M. Litin, M.D.,
Adelaide M. Johnson, M.D., Rochester, Minn.
and
Alfred J. Barron, M.A., St. Paul

Among six prisoners convicted of first-degree murder, remorseless physical brutality at the hands of the parents had been a constant experience for four of them. The most striking aspect of the interviews with the parents was the remarkable aptitude of these persons for evasive shifting of blame. This was followed by transparent evasions and calculated lying manifested by most of the parents. Factors of brutality come under the scrutiny of pediatricians and family physicians. Direct inquiry into the mode of punishment and discipline should be made by physicians whose practice includes the care of children. Intervention by physicians in known sadistic family patterns may well avert a later violent crime.

Murder is a tragic phenomenon. Sociologists, criminologists, jurists, dramatists, and novelists have studied it widely. To the present, little has been known of the causation of lone murder (unrelated to murder committed by gangs). The question arose in our minds as to how this problem could be approached and the causation defined. Since capital punishment is the law in the United States in all but seven states, removal of the person charged with murder presents an obvious difficulty to long-term investigation, but we were fortunate in working in a state in which there is no capital punishment. A pilot study of the problem was set up.

Fifteen years ago the collaborative technique in therapy and research in neurosis, psychosis, perversion, and delinquency first established itself as a tool for investigation. This technique consists of equally intensive studies of the patient as well as the parents and other significant relatives of the patient. Pooling of the information thus gained enables investigators to validate omissions, distortions, and falsehoods and suggests fields or avenues for further inquiry. Such studies may range from exploratory interviews to long-term analytic study of the unconscious. It is now established that, in cases of individual delinquency in children from so-called good families of all economic classes, the parents unconsciously foster and promote this behavior as a solution to their own unintegrated pathological needs. Similarly, there are adolescents whom we have studied who commit serious crimes, such as murder or sexual assault, and who also reveal a history of unwitting parental fostering of the offense. Timely interven-

---

From the Section of Psychiatry, Mayo Clinic and Foundation (Drs. Duncan, Frazier, and Litin), and the University of Minnesota (Dr. Johnson). Dr. Barron is a psychologist.

Read before the meeting of the American Orthopsychiatric Association, New York, March 6-8, 1958.

tion by pediatricians and general practitioners aware of such mechanisms has been of great value to the child and family. Wider knowledge of family patterns which predispose to adult murder might well be lifesaving.

Aim of Present Study

With the collaborative technique as a mode of inquiry, this project was devised as a pilot study to search for possible common factors in the life stories of a number of adult persons convicted of first-degree murder and imprisoned for life at the Minnesota State Prison at Stillwater. There is no capital punishment in this state. The study was made possible by the understanding and cooperation of the warden, Mr. Douglas C. Rigg, and his staff, to whom our grateful thanks are due. Since the terms of our study required that special attention be focused on the attitudes and behavior of the parents of these persons, only those prisoners whose parents were available for interview were included in the study.

Since our aim was to explore solely the possible causes of homicide, we did not concern ourselves with the questions of management, treatment, or punishment of the convicted person. This contentious field of forensic psychiatry was not entered. However, it was hoped that material would emerge in the pilot project which could be further validated by study in other states without capital punishment and which might assist criminologists in prophylaxis against murder and against the continuance of a family pattern which predisposes to such criminal violence.

We emphasize that no study was made of murderers associated with gangs or of those to whom crimes of violence were part of the cultural way of life. We believe that such offenses are sociologically determined and are more or less predictable and that prevention is largely a broad social problem. It was with the individual, isolated murderer, with no record of violent crime, that this study was concerned.

Criteria for Selection

The investigating procedure was as follows: Prisoners were selected according to certain criteria; namely, they were to be normally intelligent white men convicted of first-degree (premeditated) murder, who did not deny the crime and who were of middle-class background from families of good social standing. There should have been no history of addiction to drugs, alcoholism, organic disease of the brain, or epilepsy. There must have been no known history of psychosis prior to the murder. Both parents were to be available for interviews.

It should be noted that this was a preliminary study not involving extensive investigation of the parents' or prisoners' unconscious. It is to be hoped that this study will be followed by a more intensive collaborative investigation of the conscious and unconscious mental processes of prisoners and their parents.

In each instance it was made quite clear that the psychiatrists were in no way connected with the prison management, the courts, or the legislature. Participation of a prisoner would not influence his treatment or sentence in any way whatever. The prison psychologist, whom they trusted, explained the investigation to the subjects in advance and also introduced the psychiatrist to the subjects in each case. No information which the prisoner or relative wished to have maintained confidential was disclosed to anyone outside the research team. Parents and prisoners were told that their cooperation would help the investigators learn something which might be of service in the prevention of tragedies similar to their own. Of course, interviews were conducted in private.

In view of these provisions, there was minimal temptation to distort material in order to protect the prisoner or to modify his sentence. Only by such procedures could meaningful data be gathered and some measure of truth ascertained. Aside from important biographical facts, special attention was paid to the feelings and attitudes of each person interviewed and to understanding what contribution these might have made to the eventual crime. The psychiatrists were thus alerted to any attitude or manner of the parents which might have allowed their child to sense that a violent solution to disputes with others was an acceptable thing.

When six subjects had been selected, interviews were arranged with them and with their parents. In interviews with prisoners, the first striking impression was the readiness with which they discussed the crime and the events leading up to it. They also invited return interviews, although they knew that no legal advantages would accrue to them as a result of additional consultations. They did not try to escape responsibility for the crime or to lay the blame on others. Almost without exception, when the stories of prisoner and family were at variance the prisoner was found to be telling the truth. We wish to acknowledge our indebtedness to the prisoners and to their families for their ready cooperation and willingness to participate in the interviews.

These studies led to the conclusion that, among these prisoners, remorseless physical brutality at the hands of the parents had been a constant experience. Brutality far beyond the ordinary excuses of discipline had been perpetrated on them; often, it was so extreme as to compel neighbors to intercede for the boy. In no case was any effort made by the prisoner to conceal the crime or to evade capture.

The most striking aspect of the interviews with the parents was the remarkable aptitude of these persons for evasive shifting of blame. Nor was there any suggestion from them of self-criticism or guilt over their sons' upbringing or downfall. They repeatedly and steadfastly lied on many important matters of fact, often differing sharply from their spouses or offspring, and often they remained unshaken by glaring discrepancies.

We shall present reports of two of the six cases.

Report of Cases

CASE 1.—In a jealous rage, a 30-year-old man found an ax and, in the presence of neighbors, killed his former sweetheart. Originally, he had seduced her away from his brother when the latter went to Europe on military duty.

This man, the second of six children, had been the target for the most violent uncontrolled brutality on the part of the father, who, although he had a good job as a shop foreman, was a philandering alcoholic and a physical and mental sadist in his relationships with the prisoner's mother. The father's wild beatings of the boy were so frightening that neighbor men often interceded. The mother said she continued to live with the father only "to be sure he did not kill one of the boys," while at the same time her husband doted on the older daughter, of whom the prisoner was violently jealous. The father often beat and choked the mother in the children's presence. He shouted that she was a whore and that he would kill her some day. From the time the boy was 3 years old, the mother said, he recurrently ran away from home because he was so terrified of the father. From the time the boy was 14 years old, his father accused him of vicious sexual practices with girls, a charge which was not true at the time. The mother said that the father constantly "spoke evilly about other people's sex lives" in the presence of the children. At no time did the father ever accept any responsibility for his brutal acts, and he never expressed any remorse. The boy never dared to bring a young friend into the home.

The mother offered no protection to the child against the father's attacks, but she did console him afterward. She never called the police to protect the boy. She and the prisoner leaned on each other emotionally, and apparently he was always tender with her. At no time did the mother express any guilt or responsibility for having kept the boy in such a savage environment, and at the time we saw her the next oldest son was experiencing a similar life with the father. The prisoner said that without her warmth and comfort he would have killed himself long ago. He cried and moaned about his love for her for 15 minutes when she was first mentioned in the interview. He could not recall any conscious hostility toward his mother.

He always felt that his fiancée was better than he and above him socially. He made no protests when she had promiscuous affairs with others and left him. Later, for a time, he tried to win her back, after she had married. However, he began to live with a woman 10 years his senior, an occurrence which prompted his former fiancée to divorce her husband and to attempt to woo him back, promising marriage. As a result of this, he abandoned the woman with whom he had been living, whereupon the former fiancée began to go out with other men. The prisoner found an ax and killed her.

Several facts stand out in this case. First, the patient had strongly identified with his father. He saw how sadistic his father was toward the mother as well as toward himself. Although consciously he loved his mother, he hated her unconsciously for not protecting him from the years of savage attacks. Similarly, she seduced him with consolations after the assaults and sought his sympathy as years went on and her plight continued. The prisoner stole his brother's girl, felt she was above him, and then for a brief time consoled himself with an older companion. Finally, the savagery he had felt and learned at the hands of his father came out toward the alternately unfaithful and seductive fiancée. She was merely repeating the lifelong behavior of his mother, who alternately abandoned him to this father's brutality and then wooed him back with sentimental consolation.

His mother said that the father made no secret of his violent attacks on her sexually, verbally, and physically and that the sons knew all about these attacks. It was only by a stroke of luck that this prisoner actually was not killed by his father. The mother had always feared it and believed the father capable of it. The prisoner had known of his mother's fear for years. This boy, by direct example, learned that frustration and anger were to be handled by violence. He learned that men are brutal to women. The tremendous unconscious hatred for his mother, who submitted to the father and then turned to the prisoner for love, finally overwhelmed him at the expense of his alternately promiscuous and seductive fiancée.

CASE 2.—This prisoner was 27 years old when he strangled his sweetheart. When we saw him he was unable to account for his killing her. "Those 12 months with her—I wouldn't trade them even to being in this prison for life." He murdered her when she refused to marry him.

He said he wondered if he had not "misidentified" his victim with her interfering mother, of whom he said in all seriousness he would "gladly wring her neck." He also remarked, "If it hadn't been Rosie I killed, it would have been someone else—it was inevitable."

He was exceedingly bitter toward his own mother. "Mom hated me since the day I was conceived. I was an unfortunate burden on her. It wasn't my fault I was born. She has punished me ever since, though, for it. I can remember all the unmerciful beatings she gave me. She is happy now that she has completely destroyed my life."

He said she was vicious; she would choke him and beat him so hard with a barrel stave that he became bruised and bleeding. She used to say to him: "What did I ever do that God thinks I deserved to have you wished on me!"

His mother constantly belittled his father, and, whenever the father protested these humiliations, she threatened him with the "disgrace" of separation. "She destroyed any standing he might have had in my eyes," said the prisoner.

The mother told us of how her father "ran out" on the family when she was 5 years old, and she said he never supported them (a pattern her son repeated in the action of causing two unmarried girls to become pregnant and then abandoning them). Throughout her childhood the mother had been accused by other children of being illegitimate. No mention was allowed of the father by the family, and she had never heard other mention of him until she was 10 years old. It is clear how this hostility toward her father had carried over toward the son.

She reported that "the whole idea of John was a big mistake." She added that she had been angry about the pregnancy, blaming her husband's carelessness. She readily confirmed to us her son's account of her cruel and unusual punishment of him. It was remarkable to the interviewer how devoid she was of any sense of guilt about her rejection and cruelty. She explicitly said of his tantrums and ungovernable rages that "he acted how I felt." Local feeling in the community had been against the boy from the age of 5 years because of his violent temper, and from the age of 7 years he had been wrongly but persistently accused, over many years, of pushing a young companion to his death from a roof.

"His whole childhood was filled with anger," said the mother. She said she always thought he would get into trouble. "He grew up thinking the same way. He felt everyone was against him." At the time we saw her, she said she was glad the son was in prison and she hoped the authorities would never release him.

In this instance we have ample evidence for the prisoner's modeling himself after his vindictive and remorseless mother. She made it clear that the behavior of the son was in accord with her feelings. Satisfactory identification by the boy with his acquiescent, unprotecting father was not possible. The only close friend the boy had was an orphan boy older than himself who had lived with the family for a short while. As a boy, the prisoner often would stay away from school to dig worms for, and to go fishing with, a group of older men, who made much of him. His mother was aware of his truancy with these older men.

In the later life of this prisoner it seems that the mother of his sweetheart was the nominal target for his hostility, but when the girl herself spurned him he had no compunction about turning his vengeance on her. His lack of sense of guilt or restraint was modeled after those defects in his mother.

Comment

The most striking common feature in four of the six cases was the continuous, remorseless brutality which the prisoners in question had suffered at the hands of one parent, in the face of the compliant acquiescence of the other.

We discovered evidence in the case of the remaining two that the prisoners were psychotic at the time of the murder, and, of these, one was clinically psychotic during the study. In these two cases there was no history of gross brutality.

An example of the level of the brutality in the four cases was an incident in which the father held up his nude little boy by the heels, belted him, then dropped him on his head to the floor. Recurrently, some prisoners, when children, had been flung bodily across a room. Only by chance were some of them not fatally injured. Although such violence was a common factor in the four cases, it should not be concluded from them that violence is the major factor in the etiology of murder. This, at present, we cannot say. Imitation and identification with violent parents, however, constituted the commonest pattern found.

Another impressive feature was the absence of a sense of guilt on the part of the parents, yet, when the circumstances of their own upbringing became clear, the source of their hostility and of their lack of remorse was obvious. The interviewers were startled by some of the transparent evasions and calculated lying manifested by most of the parents. Yet, in contrast, the prisoners were found, by investigation, to be giving true accounts of events. The probable reason for such a situation was that the prisoners had nothing to lose by telling the truth, whereas the parents were still trying to absolve themselves from any responsibility for the tragedy. This observation confirmed findings long known to prison authorities, namely, that prisoners are most cooperative when given the opportunity to be so.

Still another interesting observation was the fact that these psychiatrically unsophisticated prisoners showed a surprising degree of insight in relating their criminal violence to their family experiences. Furthermore, documented evidence showed that no prisoner had attempted to escape from the scene of the crime and that none had denied committing the offense. All defended their actions, but none disputed the fact of the killing or of the premeditation.

Of interest to psychiatrists was the constant finding of deep, unconscious homosexual tendencies, a finding which is not surprising in view of the brutality disclosed. Often these tendencies were revealed in frankly paranoid behavior. In three of the cases such trends were reinforced by contrasting favorable treatment of a sister.

In contradistinction to previous experience with individual juvenile delinquents and adolescents guilty of serious crime in whom unconscious parental fostering was a powerful factor driving the child toward acting-out, these adult persons, convicted of first-degree murder, revealed a minimum of unconscious parental fostering. Instead, the acts of violence seemed to be much more on a conscious imitative level, reflecting actual childhood experience.

An interesting aspect of the investigation was the consistent pattern of behavior and personality of the victims. Female victims were by turns seductive and rejecting; male victims were threatening figures who carried weapons.

It seems to the investigators that factors of brutality such as have been outlined above must come under the scrutiny of pediatricians and family physicians. Direct inquiry into the mode of punishment and discipline should be made by physicians whose practice includes the care of children. It is felt that intervention by them in known sadistic family patterns may well avert a later violent crime.

Clearly, since the studies here reported are preliminary and not satistically valid, additional extensive and intensive work must be done with similar subjects. To this end, work is already under way by us with teen-age first-degree murderers.

Summary

Six prisoners convicted of first-degree murder and their parents consented to undergo investigation by the collaborative technique in a pilot study. White male prisoners were selected who were of at least average intelligence, from middle-class families, not members of a gang, not alcoholic or epileptic, and with neither organic disease of the brain nor a history of psychosis.

Remorseless physical brutality inflicted through the childhood and adolescence of the prisoner at the hands of parents was a common factor in four cases. The other two prisoners proved to have been psychotic at the time of the murder, and these two had not been treated with such gross brutality.

Unconscious fostering by parents, such as has been described frequently in individual delinquency, was not observed in these cases. Rather, the prisoners learned to behave like their brutal aggressors and learned by conscious example that violence was a solution to frustration.

The need for family physicians and pediatricians to be aware of, and to intervene in, such brutal family patterns is emphasized with a view to preventing possible tragedy.

626 S. W. Fifth St. (Dr. Johnson).

JEJUNAL INTERPOSITION OPERATION—ANALYSIS OF THIRTY-THREE CLINICAL CASES

George I. Thomas, M.D.
and
K. Alvin Merendino, M.D., Seattle

It is now possible to excise the esophagogastric junction for such conditions as reflux esophagitis with stricture with restoration of continuity and without fear of recurrent esophagitis. The operation here described involves the interposition of a segment of jejunum, from 15 to 48 cm. in length, with certain precautions taken to make sure of a good blood supply. Four anastomoses have to be made, the most crucial being that between the esophagus and the jejunal segment. In a period of six years this interposition operation has been carried out in 33 patients. Four postoperative deaths occurred, and analysis of the case histories indicates that improvements in technique would reduce the mortality significantly. Among the other 29 patients there has been no dysphagia, and the functioning of the interposed segment of jejunum has been studied by roentgen ray in patients up to six years after operation. All patients, including some with cardiospasm, esophageal varices, and lye stricture, were relieved to be able to swallow normally again, and the majority ate three meals a day, but 6 established a pattern of eating five or six times a day, and 12 were apparently unable to vomit. The substitution of a segment of jejunum for the esophagogastric sphincter is a sound physiological procedure.

In 1955, the concept of cardioesophageal sphincter substitution by the interposition of a segment of jejunum between the esophagus and the stomach was presented.[1] Included in this publication were case reports of patients in whom this operation had been performed for various lesions, mainly of the lower part of the esophagus. Since then, additional clinical experience has served to strengthen the validity of this concept.

Previous publications from this laboratory have documented the experimental background for this procedure.[2] From this work the following facts have evolved: The mucosa of the interposed jejunal segment in its new position exhibits a greater resistance to acid-peptic digestion than the mucosa of either the stomach or duodenum. By its peristaltic activity, the interposed jejunal segment prevents the regurgitation of peptic juices into the esophagus and, thus, protects the esophagus from esophagitis. Jejunitis is likewise prevented by this peristaltic action, and the isoperistaltic jejunum provides a satisfactory conduit for the passage of food into the stomach.

Consequently, the jejunal interposition operation has been utilized for a number of conditions wherein it is necessary to incise or excise the esophagogastric junction. Most frequently, it has been used in reflux esophagitis with stricture in the presence of a traction type of hiatus hernia, but the procedure has also been performed in patients with stenosing esophagitis without demonstrable hernia. In addition, the "interposition" operation has been used in patients with cardiospasm. In both situations, the need is for a new sphincteric mechanism, in one instance because of incompetency and in the other because of spasm. Patients with life-endangering esophageal varices of the extrahepatic portal bed block type, after failure of previous surgical therapy, have constituted another small group in which this operation has been utilized. In the latter situation, the philosophy of this approach is based on the assumption that massive bleeding from esophageal varices may be precipitated by reflux esophagitis and that the varices may in themselves prevent competency of the sphincter. The remaining conditions for which the operation has been used may be classified as miscellaneous, e.g., lye stricture, where there is need mainly for esophageal substitution, but for sphincteric substitution as well. No operations have been performed for histologically malignant disease, although certain of the lesions encountered may have resulted in the eventual death of the patient if the disease had been untreated.

It is the purpose of this paper to analyze the early experience with and follow-up data of 33 patients who have been subjected to the jejunal interposition operation and to describe briefly certain surgical details which, with increased experience, appear to be important.

From the Department of Surgery, University of Washington School of Medicine.

Read before the Section on Surgery, General and Abdominal, at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

Operative Procedure

The major details of the operative procedure have been described previously[1] (fig. 1). Briefly, the patient is placed in the supine position with the left side slightly elevated at a 20-to-25-degree angle.

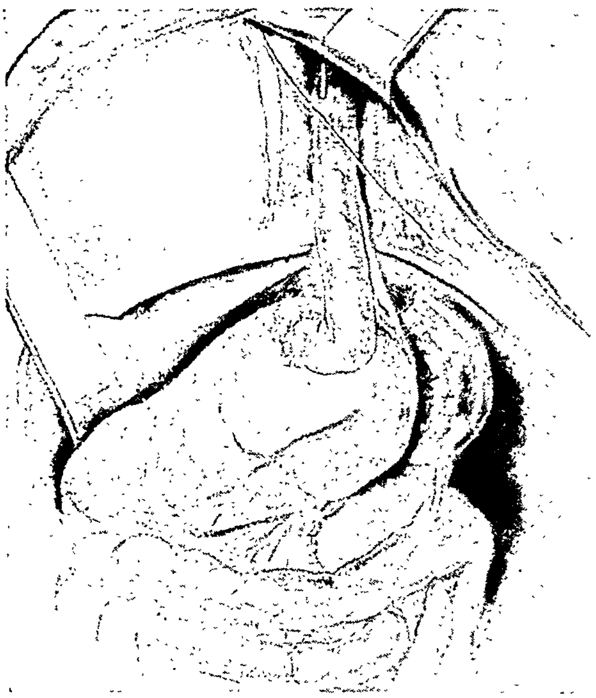


Fig. 1.—Completed jejunal interposition operation, including bilateral vagotomy and Finney's pyloroplasty. Note preservation of left phrenic nerve.

A supraumbilical midline incision is extended into the left lateral portion of the chest through the fifth or sixth intercostal space. In dividing the diaphragm, it is important to avoid severance of the phrenic nerve. Care is taken to identify the phrenic nerve within the pericardiophrenic fat pad. Once the nerve is isolated, the diaphragmatic incision is carried out medial to the main nerve trunk and lateral to the pericardial attachment with the diaphragm down to the esophageal hiatus. This effects only division of the left sternal branch of the phrenic nerve, thus denervating only a small anterior segment of diaphragmatic musculature and avoiding any major loss of pulmonary function.[3] Furthermore, one should avoid overstretching the main phrenic nerve within its sheath. Therefore, it is important to dissect the nerve from the pericardium to a point high enough to avoid overstretching of the nerve when the chest cage is retracted for exposure.

After the esophagus and a small portion of cardia ventriculi have been excised, two main details in the selection and preparation of the jejunum demand attention. The first is the selection of the major jejunal artery which will supply the segment. The first or second jejunal arteries distal to the ligament of Treitz are short and generally not used. The third or fourth jejunal arteries generally run independent of the major vein and are frequently chosen to supply the proximal segment. Here one must check the branches of the primary arcades to be sure that the junction between the intestinal arcades is adequate (fig. 2).

While attention has been drawn to the arterial patterns, the venous patterns, particularly of the major veins, are of equal importance. Ordinarily, the smaller veins parallel the arterial channels; however, the main venous trunks draining the segment may be spatially separated from the arterial trunk and must be divided with care separately. It is well to remember that the arteries, being thick-walled with high intraluminal pressure, will bend like a sapling where some pressure point exists on the segment. On the other hand, the veins, being thin-walled with low intraluminal pressure, may kink. Consequently, to avoid difficulty, a second detail of importance is to leave intact a border of mesentery along the cut edge of the segment which parallels the main vessels of the pedicle. This effects a protective zone to the vulnerable vein which may be twisted or injured. Additional length of the segment should not be attempted by stripping the vessels free of the leaves of the mesentery. It seems better to utilize a lower jejunal artery which affords a gain of from 5 to 15 cm. of jejunum. Terminal branches or collecting tubules of the jejunal arteries are direct branches of the primary arcades, which simplifies the decision as to the site of proximal division of the mesentery close to the intestine.

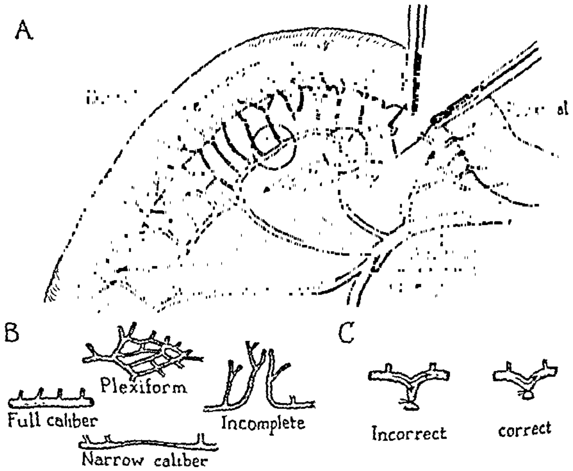


Fig. 2.—A, schematic drawing of upper jejunum, showing division and mesenteric route of dissection in order to utilize third or fourth jejunal artery for jejunal segments vascular pedicle. B, four types of arcuate (primary) connections commonly found between major jejunal arteries. C, correct method of ligating distal jejunal stump, avoiding loss of dissipation or pulse pressure to segment.

The jejunal segment is passed through an aperture in the avascular portion of the transverse mesocolon, posterior to the gastric fundus, and elevated to the divided proximal esophagus. A careful check now should be made to be certain that the pedicle is free from rotation, kinking, or pressure. It should lie loose and easily in the open hiatus, without tension on its vasculature. The various anastomoses are carried out in a standard fashion and need no additional comment.

In this series, the length varies from 15 to 48 cm., depending on body build, amount of esophagus resected, and anatomic arrangement of the jejunal vasculature. However, it is important that any excess jejunum lies below the diaphragm after diaphragmatic reconstruction. At this stage, it is important to suture the jejunal wall to the edge of the new diaphragmatic hiatus and condition the intraperitoneal arrangement of jejunum by an indwelling nasogastric tube in order to avoid any obstruction of the segment.

In this series of 33 patients, in the first 2 the operation was done as a two-stage procedure and in 30 as a one-stage procedure. In one patient, who had a long esophageal lye stricture, the jejunal loop was brought up in the anterior mediastinum because of technical difficulties associated with multiple previous abdominal procedures. A second-stage cervical esophagojejunal anastomosis then was performed eight weeks later. Also for technical reasons, in four patients a Heineke-Mikulicz pyloroplasty was performed instead of Finney's pyloroplasty. The latter appears to provide more adequate gastric drainage and, in our experience, is the preferable ancillary drainage procedure accompanying vagotomy.

Preliminary gastrostomy was carried out in two patients because of the need for laparotomy prior to cardioesophageal resection (complete esophageal obstruction from lye stricture in one patient and esophageal perforation in another). Postoperative gastrostomy for gastric suction has not been found necessary, since a nasogastric tube is always inserted for the purpose of conditioning the arrangement of excess jejunum below the diaphragm.

In patients with evidence of moderate weight loss, blood transfusions and high-calorie, high-protein, liquid diets (often administered through the finest of polyethylene catheters in the presence of a tight stricture) aid in the preoperative management.

Clinical Material

From Oct. 1, 1952, through March, 1958, a period of five and one-half years, 33 patients were operated on for various lesions of the esophagus or cardioesophageal sphincter. Table 1 shows in tabulated form the heterogeneous group of cases comprising this series. The predominant lesion for which the operation was performed was peptic esophagitis. In these 20 patients, varying degrees of organic stricture were common to all with associated dysphagia, substernal pain, heart burn, dietary restriction, and weight loss. Repeated dilatation had been performed in 11 of these patients. An additional five patients of this group had had previous attempts at transthoracic repair of hiatus hernia (table 1).

Seven patients with symptomatic cardiospasm were operated on, four being treated primarily by excision and jejunal interposition, and three by this procedure after previous operative measures had failed to achieve satisfactory results. The remaining six patients required cardioesophageal replacement for the following conditions: esophageal varices, lye stricture, and an operation-induced esophageal stricture which has been termed "iatrogenic" stricture. Previous major operations (excluding dilatation) in 11 patients are listed in table 1.

Table 1.—*Previous Major Operations in Eleven Patients*

	Operations, No.	Patients, No.
Peptic esophagitis with stricture		
Transthoracic hiatus hernia repair	5	5
Cardiospasm		
Cardioplasty, type unknown	1	1
Transthoracic hiatus hernia repair	1	
Gröndahl procedure	1	1
Subtotal gastrectomy (80%)	1	
Heller esophagomyotomy	1	1
Esophageal varices		
Splenectomy	1	1
Subtotal gastrectomy (75%)	1	
Portocaval anastomosis	1	
Splenectomy	1	1
Failed portocaval anastomosis	1	
Transesophageal ligation	1	
Iatrogenic stricture		
Transthoracic hiatus hernia repair	3	1
Total	19	11

The youngest patient in this series was 8 years and the oldest 75 years of age. Ten patients (33.3%) were between 60 and 75 years of age. Twenty-one patients were men, with a sex ratio of 2.2 men to 1 woman.

Immediate Results

Of the 33 patients operated on, a careful follow-up of 32 patients has been possible. Only one patient was lost to the study. This series is presented as an early experience with a new procedure, and certain difficulties have been encountered as a natural consequence of learning. Table 2 reveals all the complications encountered. In each operation, four anastomoses are performed. Thus, a total of approximately 130 anastomoses were carried out. Three suture-line leaks occurred, and all were at the esophagojejunal anastomoses. Six major electrolyte disturbances occurred and have been included under hyponatremia, symptomatic or asymptomatic. Serum sodium levels under 128 mEq. per liter were present in all six patients, with three producing such symptoms as mental torpor, confusion, lassitude, and fatigability. Two patients required interval postoperative resection of un-healed or ununited costocartilages at the junction of the thoracic and abdominal incision. These nonunions produced pain and/or unpleasant false motion of the chest and were relieved by simple excision. In one patient, a subscapular infection required partial scapulectomy and drainage. Cardiopulmonary complications have been surprisingly low, despite the somewhat advanced age of the majority of patients. Preoperative preparation, attention to details, and, especially, postoperative care of the tracheobronchial tree are most important. Tracheotomy was performed in three patients who were unable to manage excessive tracheobronchial secretions. There were four postoperative deaths (12.1%). A brief summary of each case is presented here.

Table 2.—*Complications After Jejunal Interposition Operation in Thirty-three Patients*

	Complications, No.	Fatalities, No.
Cardiopulmonary		
Atelectasis	3	...
Pneumonia	2	...
Pleural effusion	2	...
Empyema	2	...
Pneumothorax	1	1
Intestinal		
Esophagojejunal leak	3	1
Jejunal venous infarction	1	1[*]
Gastric perforation	1	1
Diarrhea, severe	1	...
Wound		
Superficial infection	1	...
Deep infection	1	...
Electrolyte		
Hyponatremia, asymptomatic	3	...
Hyponatremia, symptomatic	3	...
Miscellaneous		
Cut-down thrombophlebitis	1	...
Traumatic splenic rupture	1	...
Ununited costocartilages	2	...
Subscapular infection	1	...
Excessive tracheobronchial secretion	3	...
Cerebrovascular accident	1	1[*]

[*] Same patient.

Report of Cases

Case 1.—A 75-year-old woman was operated on for peptic esophagitis, ectopic gastric mucosa, and stricture on Oct. 6, 1954. Preoperative dilatation had been of no benefit. A 30-cm. jejunal segment was interposed between the esophagus, immediately below the aortic arch, and stomach combined with Finney's pyloroplasty and bilateral vagotomy. On Oct. 14, severe hypochloremic alkalosis was present with dehydration, shock, fever, left lower lobe atelectasis, and pneumonia. Despite correction of electrolyte imbalance and administration of massive doses of antibiotics, death occurred on Oct. 19, 13 days after operation.

Autopsy findings included left lower lobe atelectasis and pneumonia, mediastinitis with small abscess, and perforation of the distal part of the stomach with abscess (due to a hard, plastic tube penetrating the stomach wall), producing outlet obstruction of the stomach which abetted and perpetuated the electrolyte problem.

Since this experience, no plastic nasogastric tubes have been used in these patients.

Case 2.—A 53-year-old man, a chronic alcoholic, was operated on for peptic esophagitis with stricture and traction-type hiatus hernia on Feb. 2, 1956. A 15-cm. jejunal segment was interposed between the lower part of the esophagus and stomach with bilateral vagotomy and Finney's pyloroplasty. Fifteen hours after the operation, massive subcutaneous emphysema was present with respiratory insufficiency. Death occurred early on Feb. 7, 1956.

An autopsy permit was not obtained. It is assumed that a major tracheobronchial leak existed in the presence of an occluded thoracotomy drainage tube.

At surgery, there was obliteration of the pleural space due to visceroparietal adhesions. These were divided and the lung mobilized without evidence of air leak at that time. On the evening of surgery, subcutaneous emphysema was noted. The severity of this was not appreciated, and early the next morning extreme respiratory distress occurred. Inadequate nursing staff at this inopportune time resulted in delay of communication to the resident staff and the needless death of this patient. The obvious therapy needed was a tracheotomy and evacuation of trapped pleural air. This death was entirely preventable.

Case 3.—A 56-year-old man was operated on for peptic esophagitis with stricture and traction-type hiatus hernia on Jan. 29, 1957. A 25-cm. jejunal segment was interposed between the midesophagus and stomach at the level of the aortic arch. The procedure was prolonged due to venous infarction of the first segment replaced by a second segment; the latter anastomosis was accomplished through a second thoracotomy incision. A right-sided hemiplegia with signs of cerebral anoxia was present the next day. The gastric tube drainage became bloody, amounting to 2,500 cc. by the second postoperative day, at which time death occurred. At no time was the patient's general condition satisfactory for reexploration.

Autopsy findings included cerebral thrombosis on the left side, both old and recent, pulmonary emphysema with healed pleuritis, and venous congestion (infarct) of jejunal segment with intestinal hemorrhage due to jejunal vein damage.

This patient had had pulmonary emphysema of moderate degree, a cerebral vascular accident three months prior to operation, and treated syphilis with residual tabes dorsalis. Irrespective of the direct cause of death, he was a poor candidate for this or any other major surgical procedure, and the decision to operate represents an error in surgical judgment. The need for a second thoracotomy incision to facilitate the esophagojejunal anastomosis indicates the inadequacy of the exposure for an anastomosis directly under the aortic arch in the left thoracotomy incision in continuity with the abdominal incision. When an anastomosis must be made high under the aortic arch, separate abdominal and right thoracotomy incisions now are advocated.

Case 4.—A 53-year-old man was operated on for peptic esophagitis, stricture, and hiatus hernia on June 27, 1957. A 26-cm. jejunal segment was interposed between the midesophagus and stomach, combined with Finney's pyloroplasty and bilateral vagotomy. Inadvertently the segment was rotated 360 degrees, and the esophagojejunal anastomoses had to be taken down. A second difficult anastomosis was accomplished immediately under the aortic arch. Ineffectual coughing, atelectasis, and profuse secretions necessitated tracheotomy on the fifth postoperative day. On the seventh day, gastrointestinal bleeding occurred with evident pyopneumothorax on the right side. The patient died on July 4, 1957, despite transfusions and the insertion of a thoracotomy tube in the right pleural cavity.

Autopsy findings included mediastinal and right pleural empyema, esophagojejunal anastomotic leak with esophagopleural fistula, severe tracheobronchitis, and left lobe pneumonia.

Again, this case shows that the proximal esophagojejunal anastomosis is the most critical anastomosis to perform. The higher the resection is, the more difficult it is to secure an accurate two-layer anastomosis. As noted previously, it is now preferred to use a midline supraumbilical incision and a separate right thoracotomy incision for high infra-aortic arch anastomoses.

Table 3.—*Data in Twenty-five Patients Available for Follow-up Study After Jejunal Interposition Operation*

Case	Age, Yr.	Diagnosis	Follow-up Period, Mo.	Weight, Lb.		Meals, No. per Day	Swallowing	Dumping Syndrome		Diarrhea	Indigestion	Vomiting	Alcohol	Comment and Results
				Preoperative	Postoperative			Early	Late					
1	48	Esophagitis	63	117	133	3	Normal	No	No	0	0	0	++++	Very satisfied
2	49	Esophagitis	51	130	128	5	Slow delay	Yes	No	0	Gas	+	++++	Severe alcoholic neuritis, doubtful result
3	51	Varices	48	145	147	5-6	Moderate delay	Yes	No	+	0	0	0	Not working; dissatisfied†
4	49	Cardiospasm	45	133	146	3	Normal	No	No	0	0	0	+	Working; satisfied
5	22	Varices	42	145	150	3-4	Normal	Yes	Yes	+	0	+	+	Student; very satisfied
6	49	Esophagitis	40	136	127	3	Slow delay	No	No	0	0	0	0	Satisfied
7	56	Esophagitis	38	130	170	2	Slow delay	Yes	Yes	+	0	0	++++	Chronic alcoholic; satisfied
8	68	Stricture	36	143	120	3	Normal	No	No	0	Gas	0	0	Very satisfied
9	70	Cardiospasm	34	114	120	5	Normal	Yes	No	0	Heartburn*	0	+++	Satisfied
10	47	Esophagitis	34	141	150	3	Normal	Yes	No	+	0	0	++++	Chronic alcoholic; satisfied
11	64	Esophagitis	29	120	108	3	Normal	Yes	No	0	0	0	0	Very satisfied
12	61	Esophagitis	28	130	119	3	Delay	No	No	0	0	+	0	Very satisfied
13	37	Cardiospasm	26	94	95½	3-5	Normal	Yes	No	0	Heartburn*	0	0	Anemia from previous gastrectomy; satisfied
14	44	Cardiospasm	26	115	175	3	Normal	No	No	0	0	0	0	Very satisfied
15	39	Esophagitis	26	112	110	3	Normal	No	No	0	0	0	0	Very satisfied; appetite poor
16	64	Esophagitis	22	119	135	3	Normal	Yes	Yes	+	Gas	0	++	Very satisfied
17	10	Esophagitis	21	23	30	4	Normal	Yes	...	...	...	...	...	Mongoloid child (institutional)
18	68	Esophagitis	18	125	133	3	Normal	No	No	0	0	0	0	Very satisfied
19	70	Esophagitis	15	127	128	3	Normal	No	No	0	0	0	0	Satisfied
20	54	Lye stricture	13	93	125	3	Normal	No	No	0	0	0	0	Very satisfied
21	75	Esophagitis	12	135	128	4-5	Delay	Yes	No	+	0	0	0	Satisfied; incisional chest pain
22	50	Cardiospasm	10	115	110	3	Normal	Yes	No	+	0	0	0	Very satisfied
23	28	Esophagitis	5½	165	181½	3	Normal	Yes	No	+	0	0	0	Very satisfied
24	73	Cardiospasm	4½	80	93	4	Delay	No	No	0	0	0	0	Satisfied
25	41	Lye stricture	2½	108	128	5	Normal	No	No	0	0	0	0	Very satisfied

* Esophagoscopy done repeatedly, with no regurgitation or esophagitis demonstrated.

† Operated on for esophageal varices, extrahepatic type, with complicated course and prolonged hospitalization. During hospitalization diabetis mellitis became manifest. In addition, there have been two minor episodes of melena.

Late Results

There were three late deaths (9.1%), none of which were attributable to the jejunal interposition operation. The interval from operation to death was 6 months in a 59-year-old man,. 12 months in a 67-year-old man, and 23 months in a 72-year-old man. All three were severe chronic alcoholics; alcoholism was the direct cause of death in one patient. The cause of death in another was accidental strangulation while intoxicated, and the third died of a cerebral vascular accident. Unfortunately, no tissue was available for pathological study, due to circumstances associated with the death of each patient.

Follow-up Analysis

Table 3 is a tabulation of the critical features in each of the 25 patients (75.7%) available for follow-up study.

Weight.—There was a gratifying weight increase in 68% of the patients, ranging from 10% to a high of 43.4% over the preoperative weight. The average gain of these 17 patients was 14.1% over the preoperative weight. Eight (32%) of the series showed an average decline in weight of 6.2% (fig. 3). There appears to be no significant increase or decline when plotting the postoperative interval against percentage weight gain or weight loss. The only correlation with respect to the time interval after operation is that, in general, a stationary level was reached and then maintained within a six-month period. During this period of time, dietary readjustments occurred and a distinctive pattern of calorie intake was established. Three of the patients in the weight loss group were severe alcoholics with extremely poor dietary habits.

The majority of the patients had lost weight prior to operation; therefore, the correct or normal weight could not be adequately ascertained. None of the patients were severely debilitated or starved, and the preoperative weight used for comparison reflected the best nutritional state possible prior to the operative procedure. The over-all pattern indicates a significant metabolic improvement.

Meals.—During the first three to nine months, most of the patients experienced substernal and epigastric discomfort with ingestion of food quantities approximating a normal-size meal and, therefore, ate more frequently. After this period, the majority of patients ate three meals a day, corresponding to the normal eating habits of other members of their family. There appears to be no major restriction of any particular food, though three patients developed a definite dislike for dairy products, particularly milk. Of the entire group, six patients, all operated on over two years ago, have, at the time of writing, established a pattern of eating four to five times per day.

Swallowing.—There was no dysphagia in the entire group. All of the patients expressed delight in the ability to swallow "normally" without pain, and this is a most pleasant experience for this group of patients. Seven patients claimed that there was a delay in the swallowing mechanism. In three patients, this was a definite though minor annoyance. In one patient, x-ray showed active peristalsis of the 20-cm. jejunal segment with rapid emptying of both *jejunum and stomach. His subjective feeling* of delay is, therefore, unexplainable.

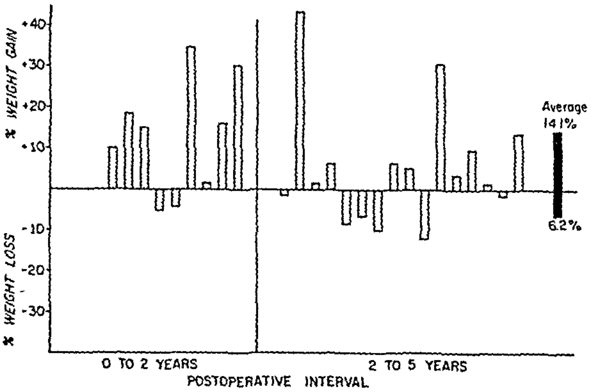


Fig. 3.—Weight gain or loss in 25 patients after operation.

Figure 4 shows a sequence of a peristaltic wave outlined by barium swallow passing through a 25-cm. jejunal segment which was interposed almost six years ago in one patient. Although peristalsis remains active in these sequestrated segments, *there can be no doubt that the passage time* of food through the jejunal segment is delayed over that of the proximal normal esophagus. Truly remarkable, however, is the high percentage (72%) of patients with subjective normal swallowing. The explanation of this essential normality in swallowing probably is the fact that the average bolus of food swallowed does not overdistend the jejunal loop. Whereas swallowing of solid material was normal in most of the patients, many noticed an inability to drink fluids rapidly, since this produces an uncomfortable sensation in the substernal or epigastric regions. This probably produces rapid distention of the jejunum, and the symptoms are related thereto.

Dumping Syndrome.—We define "dumping" as the occurrence of "sweating," unpleasant warmth, subjective flushing, weakness, palpitation, nausea, or explosive diarrhea, with the onset within 15 minutes after eating and lasting up to 45 minutes, relieved partially by lying down. Thirteen patients (52%) experienced one or more of these symptoms *in varying degrees early in the postoperative period.* In only one patient was this incapacitating. A short period of hospitalization was required for management. Late dumping was present in three patients (13.3%) and was of no major significance. Two of these patients were troubled with the dumping syndrome only after eating sugar. The *presence of Finney's pyloroplasty may account for* this. One additional patient, a severe chronic alcoholic, had frequent bouts of diarrhea, while six patients had occasional and transient episodes of diarrhea, possibly attributable to the vagotomy.

Ability to Vomit.—The question has arisen as to whether these patients can vomit. Three patients (12%) were capable of true vomiting, i. e., the regurgitation of digested or partially digested, bitter tasting, bile-stained food from the stomach. Four other patients (16%) stated that they were able to regurgitate food, phlegm, or mucus, but only in small amounts and often immediately after eating. This does not represent true vomiting, but *simply regurgitation from the esophagus or jejunal* segment.

In the remaining 18 patients, 12 (48%) were apparently unable to vomit. None felt that this is a disadvantage, and two patients expressed the opinion that there was a certain advantage in not being able to vomit. Five (20%) had no experience, and in one the information was not known. There was no correlation between the ability to vomit and the jejunal segment length or any other aspect of the surgical procedure. Experimentally, dogs with interposed jejunal segments demonstrated no anatomic lesions when sacrificed immediately after severe vomiting induced by apomorphine administration.

Alcohol Intake.—Because alcohol provokes excessive acid-peptic secretion and therefore affords a severe test for the operative procedure, we have been particularly interested in the postoperative course of the chronic alcoholics who have been subjected to jejunal interposition. Of nine patients, six are included in the follow-up group. Four were operated on over 22 months ago. One patient has had mild heartburn, particularly after drinking, but no esophagitis by esophagoscopy. The remaining three were very satisfied with their operation. The longest follow-up study in this regard was in a patient who was operated on over 69 months ago. Despite constant alcoholic ingestion and two hospitalizations for pellagra, he is completely asymptomatic. There is no doubt that vagotomy and Finney's pyloroplasty reduce the ulcerogenic response of alcohol in the stomach; needless to say, it is an unphysiological stress agent and is in the same category as the stimulation of parenterally given histamine in the test dog.[4] The overindulgence in alcohol plus the associated lack of neutralizing food in the stomach constitutes a severe test of the jejunum segment as well as the stomach and duodenum.

Comment

This study indicates that all patients have been cured of the disease for which the operation was performed. Consequently, the concept of sphincter substitution appears valid. Furthermore, any speculation concerning the ability of the jejunal segment to resist acid-peptic digestion has been negated by absence of any evidence of such pathology to date.[5] Though sequestrated from the small intestine, such segments are capable of sending off afferent pain stimuli when affected by such factors as ulceration.[6] There has been no evidence by history or repeated x-ray studies of any such difficulty in this group of patients.

One gratifying result of operation has been the postoperative weight gain in almost 70% of patients. However, this was not a matter of great concern, for the only possible detrimental metabolic effect of the operation is related to vagotomy and pyloroplasty. These effects have been well documented and, in the main, are not of great moment. The other aspect of the operation is the repositioning of a small segment of jejunum interposed between the esophagus and stomach. As the stomach is intact and the admixture of food, gastric juice, bile, and pancreatic juice occurs in normal sequence, any disturbance in metabolic processes would indeed have been surprising.

From the patient's viewpoint, the most important benefit of the operation is the ability to swallow without awareness of any abnormality. This was characteristic of the vast majority of patients. While it is true that some patients ate more slowly than normal, this was a minor annoyance in only three. This consequence of operation is not surprising, for the transit time of the passage of food through the normal esophagus aided by primary and secondary peristaltic waves is very rapid; when the food bolus reaches the jejunal segment, the latter is not neurogenically synchronized with the proximal esophagus. Consequently, food is carried from the esophagojejunal junction into the stomach by an intestinal segment with a slower peristaltic pattern. It is surprising that so few patients were aware of any abnormality of swallowing.

On the negative side, 14% of this group of patients exhibited a mild form of dumping syndrome which in no way affected their health. Probably, these symptoms are related to the pyloroplasty. Because the segment is short and the transit time rapid, the possibility of an osmotic effect seems remote.[7] In general, major surgical procedures alle-

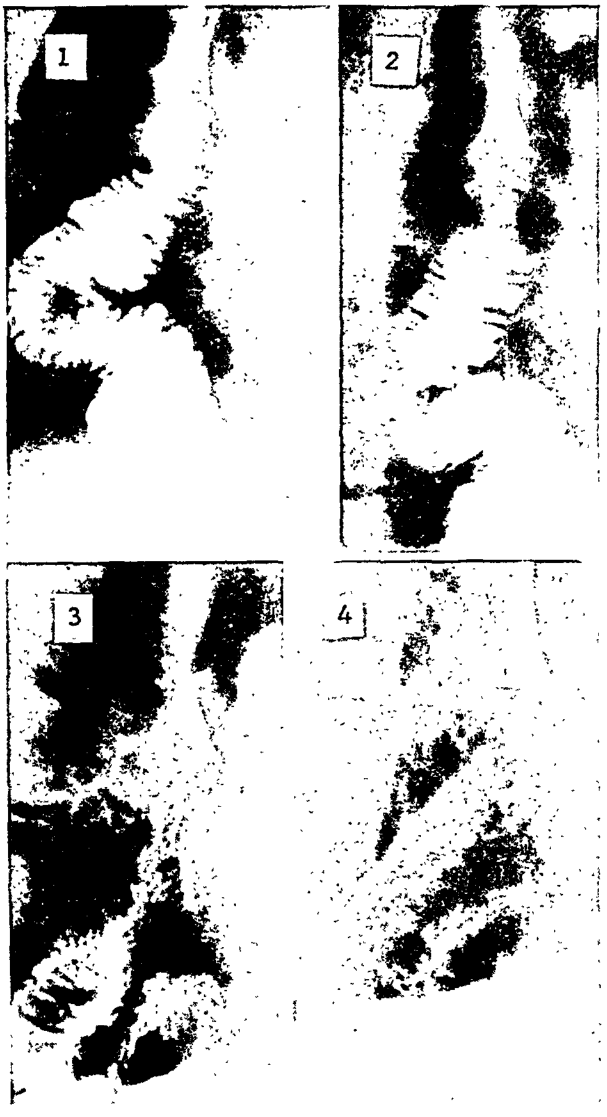


Fig. 4.—Views of swallowing sequence taken at two-second intervals, representing rapidity of action of jejunal segment interposed on June 3, 1952. Redundancy noted in chest has not increased over that existing in early x-rays and has been eliminated in majority of subsequent cases.

viate a major disorder and the patient endures some other minor symptoms. The advantages gained by the operative procedures seem to outweigh by far the minor complaints encountered thus far in this study.

As with many new operative procedures, one encounters a high mortality. Additional experience usually results in a betterment on this score, suggesting that certain deaths were preventable. The mortality of 12.1% in this series is high. However, no patient with the proper indications has been denied surgery in an attempt to define the proper place for this procedure. Errors in judgment, surgical technique, and postoperative care have been made. The clinical experience gained should be reflected in less risk to subsequent patients. Attention should be drawn, however, to the fact that one-third of the patients were in the sixth and seventh decades of life. Furthermore, these patients represent treatment failures on both medical and surgical grounds. In one-third of the patients, the interposition operation was the second, third, or fourth major operative attempt for alleviation of the patient's disease.

An additional factor worthy of comment in evaluating the risk of any operative procedure is related to the life history of the disease itself and the philosophy of the surgeon. The diseases for which this operation has been undertaken result in prolonged, severe disability and, frequently, death of the patient over a period of time if untreated. Our philosophy has been to accept a higher risk in this group of patients in order to obtain a cure of the disease.

Summary and Conclusions

Over a five and one-half year period, 33 patients with various "benign" lesions of the esophagus and cardioesophageal sphincter have been subjected to the jejunal interposition operation.

Certain features of the operative techniques have been emphasized to insure viability of the sequestrated and interposed segment, as well as preservation of diaphragmatic function. The operative mortality of this series was 12.1%.

The interposition of a physiological sphincter at the esophagogastric junction has prevented the occurrence of postoperative esophagitis after cardioesophageal removal in all of the patients followed up in this series. Ninety-six per cent of the patients were improved after the operation. Eighty-eight per cent were classified as showing an excellent result.

Normal swallowing was present in the majority of patients, with an incidence of 13.3% of late mild dumping syndrome and significant metabolic improvement reflected in an average weight increase of 14.1% in two-thirds of the patients.

The jejunal interposition operation, by its very design, is a sound physiological procedure which satisfies the need for a substitute esophagogastric sphincter. The resistance of the jejunal mucosa to peptic digestion, the prevention of esophagitis, and the excellence of the jejunum for transporting food support the findings of the same experimental preparation in the laboratory.

This study was supported, in part, by grants from the U. S. Public Health Service and Initiative 171 Funds from the State of Washington for Research in Biology and Medicine.

References

1. Merendino, K. A., and Dillard, D. H.: Concept of Sphincter Substitution by Interposed Jejunal Segment for Anatomic and Physiologic Abnormalities at Esophagogastric Junction, with Special Reference to Reflux Esophagitis, Cardiospasm and Esophageal Varices, Ann. Surg. **142:**486-509 (Sept.) 1955.

2. Dillard, D. H., and Merendino, K. A.: (*a*) Experiences with Interposed Jejunal Segment Operation Combined with Adjunct Procedures in Prevention of Esophagitis: Experimental Study, S. Forum (1954) **5:**323-328, 1955; (*b*) New Studies in Dog Supporting Concept of Equal Resistance of Various Levels of Intestinal Tract to Acid-Peptic Digestion, Surg. Gynec. & Obst. **103:**289-302 (Sept.) 1956. (*c*) Girvin, G. W., and Merendino, K. A.: Cardiac Sphincter Substitution by Interpositioned Jejunum, A. M. A. Arch. Surg. **72:**241-246 (Feb.) 1956. (*d*) Hoag, E. W.; Kiriluk, L. B.; and Merendino, K. A.: Experiences with Upper Gastrectomy, Its Relationship to Esophagitis with Special Reference to Esophagogastric Junction and Diaphragm: Study in Dog, Am. J. Surg. **88:**44-55 (July) 1954. Kiriluk, L. B., and Merendino, K. A.: (*e*) Further Experiences in Dog with Esophageal Pathology Following Esophagogastrectomy, S. Forum (1952) **2:**59-63, 1953; (*f*) Comparative Sensitivity of Mucosa of Various Segments of Alimentary Tract in Dog to Acid-Peptic Action, Surgery **35:**547-556 (April) 1954; (*g*) Experimental Study of Buffering Capacity of Contents of Upper Small Bowel, ibid. **35:**532-537 (April) 1954. (*h*) Skinner, H. H., and Merendino, K. A.: Experimental Evaluation of Interposed Jejunal Segment Between Esophagus and Stomach Combined with Upper Gastrectomy in Prevention of Esophagitis and Jejunitis, Ann. Surg. **141:**201-207 (Feb.) 1955.

3. Merendino, K. A.; Johnson, R. J.; Skinner, H. H.; and Maguire, R. X.: Intradiaphragmatic Distribution of Phrenic Nerve with Particular Reference to Placement of Diaphragmatic Incisions and Controlled Segmental Paralysis, Surgery **39:**189-198 (Jan.) 1956.

4. Thomas, G. I., and Merendino, K. A.: Evaluation in Dog of Cardiac Sphincter Substitution by Interposed Colon in Presence of Vagotomy and Finney Pyloroplasty, Surgery **41:**993-998 (June) 1957. References 1 and 2*c*.

5. Cooper, W. A.: End Results in Treatment of Peptic Ulcer by Posterior Gastroenterostomy, Surgery **23:**425-441 (March) 1948. Illingworth, C. F. W.: Peptic Ulcer, Baltimore, Williams & Wilkins Company, 1953, pp. 172-174.

6. Henley, F. A.: Gastrectomy with Replacement, Ann. Roy. Coll. Surgeons England **13:**141-160 (Sept.) 1953.

7. Roberts, K. E., and others: Cardiovascular and Blood Volume Alterations Resulting from Intrajejunal Administration of Hypertonic Solutions to Gastrectomized Patients: Relationship of These Changes to Dumping Syndrome, Ann. Surg. **140:**631-640 (Nov.) 1954.

CLINICAL NOTES

DIRECT CORONARY ARTERY PERFUSION FOR AORTIC VALVE SURGERY

REPORT OF TECHNIQUE

Earle B. Kay, M.D., Louis R. Head, M.D.
and
Cid Nogueira, M.D., Cleveland

It has been apparent during the developmental phase of aortic valve surgery that further progress would come only when the aortic valve could be exposed for a sufficiently long period of time to allow for the proper evaluation of the pathological features and their definitive correction. In the past, partial correction with a high operative mortality has been obtained with the use of closed techniques or hurried procedures with the patient under hypothermia.

With the advent of extracorporeal circulation with the use of a mechanical pump oxygenator, 12 patients with aortic stenosis and regurgitation have been operated on during the past three years. If the patient was fortunate enough to have primarily fibrous aortic stenosis which could be corrected within a relatively short period of time, such operations could be successfully performed with use of elective cardiac arrest with potassium or acetylcholine and retrograde coronary sinus perfusion. However, if the valve was highly calcified or associated with regurgitation and the time required for the surgical correction of the stenosis and relief of the regurgitation by the addition of plastic cusps was greater than 20 minutes, then failure frequently ensued as a result of cardiac arrhythmias associated with the resulting myocardial anoxia.

There was no operative mortality in six patients in whom the cardiac arrest was 20 minutes or less, contrasted with an 80% mortality in those patients requiring more than 20 minutes. The greater myocardial anoxia associated with the longer period of aortic valve exposure undoubtedly was the factor largely responsible for the failure. However, the valves in such patients were also the most severely destroyed and the myocardial reserve probably the poorest. Unfortunately, one cannot foretell in advance the time that will be required for definitive surgery. Direct coronary artery perfusion, providing a well-oxygenated beating heart in the patient here reported on, allowed successful exposure and correction of the aortic valve throughout a 42-minute period.

Technique of Direct Coronary Artery Perfusion

In the laboratory it was found that aortic occlusion with and without cardioplegic drugs would allow successful exposure of the valve for a period of 20 to 30 minutes with a return of a normal beat in 75% of the dogs. In our experience, retrograde coronary sinus perfusion with arterialized blood did not increase either the safety or length of time over a 20-minute period that the aortic valve could be exposed. This technique also has the deleterious aspects of incomplete myocardial perfusion because of the anatomic arrangement of the coronary veins; in addition, it not infrequently causes considerable myocardial petechial hemorrhages.

It soon became apparent that to be successful in the majority of instances requiring longer periods of time for definitive correction of the lesion and to avoid the undesirable features of the other techniques, the hypertrophied myocardium in these damaged hearts must be kept well oxygenated and beating. Consequently, for the past two years we have been attempting to devise in the laboratory suitable cannulas for direct coronary artery cannulation and perfusion which does not interfere with the exposure of the aortic valve.

After many failures with various types of cannulas, a type was recently developed which appears to be suitable and which has been successfully used clinically. These cannulas, as demonstrated in the figure, consist of a set of two mounted on a flexible spring which gives rise to lateral pressure and which helps maintain the cannulas in place. This spring can also be adjusted to give maximum space between the cannulas to allow for aortic valve exposure. The main advantage of these cannulas consists in a movable flexible tip that adjusts itself to the coronary artery irrespective of the position of the remaining arm of the cannula. This tip joins the cannula by means of a ball valve which is the movable part and which fits snugly into the orifice of the artery and prevents the retrograde loss of blood. The cannulas are further maintained in position by a suture passed around the coronary artery, through the aortic wall, and around the cannula proximal to the ball valve. It is advisable to have at least two sizes of cannulas because of the variation in the size of the coronary arteries.

The pertinent aspects in the use of these cannulas for direct coronary artery perfusion during surgical correction in a patient with a combination of aortic stenosis and regurgitation are here described.

Report of a Case

A 30-year-old man, who weighed 180 lb. (81.6 kg.), had his first attack of rheumatic fever at the age of 15 years. He remained well until the age of 28, when he began noticing increasing dyspnea on exertion. He had both a systolic and a diastolic murmur over the aortic valve. The blood pressure ranged around 140/30 mm. Hg. The roentgenograms revealed an enlarged heart with severe left ventricular hypertrophy. The electrocardiogram revealed the presence of left ventricular overloading, a first degree atrioventricular block, and remote anteroseptal myocardial damage.

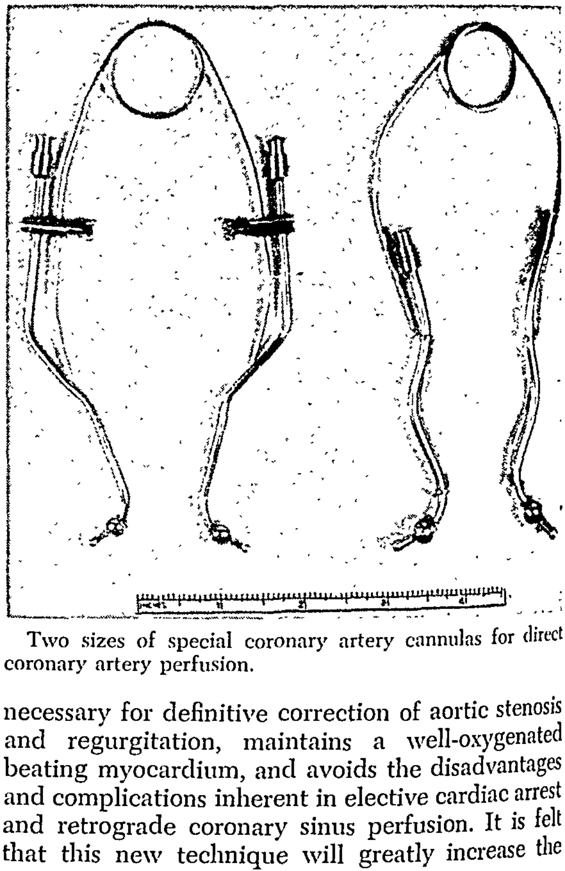
On April 24, 1958, the patient was operated on by means of extracorporeal circulation with the Kay-Cross rotating disk oxygenator. A harsh systolic thrill could be palpated in the base of the ascending aorta, which was markedly enlarged and measured 2 in. in diameter. Pressures in the aorta were 170/30 mm. Hg. The machine was then started with a perfusion rate of 3,500 cc. per minute. The ascending aorta was cross-clamped, 820 mg. of acetylcholine was injected, and the aortic valve was exposed through a Meyer's hockey stick incision. The coronary arteries were then cannulated and perfused with 150 cc. of arterialized blood per minute. This was gradually increased to 350 cc. per minute. After approximately one minute, normal cardiac rhythm was established and maintained throughout the procedure, which lasted for 42 minutes. The acetylcholine was used as a safeguard in the event that it might take unduly long to perform the coronary artery cannulations; its use probably is not necessary.

The aortic valve was highly calcified and showed evidence of both stenosis and regurgitation. Large chunks of calcium were removed from the left lateral and anterior cusps, which were also markedly shrunken and fibrotic. The other two commissures were widely opened. The posterior cusp was fairly pliable but tended to herniate toward the ventricular cavity. This cusp was supported in its anatomic position by sutures at the adjacent commissures, which also included the annulus. The regurgitation was then corrected by the addition of a cusp of compressed Ivalon (16 to 1 mm.) fixed by interrupted sutures to the aortic side of the left lateral and anterior cusps. This allowed for complete apposition of the cusps. The aortic incision was closed except for 1 cm. through which the cannulas were removed. The aortic suture was then finished, followed by removal of the aortic clamp and cessation of use of the machine. The mean arterial pressure as registered in the superficial femoral artery manometer continued to be 100 mm. Hg. Pressures again recorded in the ascending aorta were now 130/80 mm. Hg.

The patient's postoperative course was uneventful, and he has made an excellent recovery with relief of symptoms and a decrease in heart size. The blood pressure four months postoperatively was 140/100 mm. Hg.

Summary

Successful open aortic valve surgery has been limited in the past because of lack of a suitable technique for maintenance of an oxygenated myocardium and a beating heart which has necessitated hurried and partial valvular corrections. The technique of direct coronary artery perfusion through especially devised cannulas allows all the time necessary for definitive correction of aortic stenosis and regurgitation, maintains a well-oxygenated beating myocardium, and avoids the disadvantages and complications inherent in elective cardiac arrest and retrograde coronary sinus perfusion. It is felt that this new technique will greatly increase the success of aortic valve surgery.



Two sizes of special coronary artery cannulas for direct coronary artery perfusion.

10465 Carnegie Ave. (Dr. Kay).

THE CONSTIPATED COLON.—Most writers when writing about constipation begin their discourse by dividing the cases into two groups, one with a supposedly atonic colon and the other with a spastic colon. I am satisfied that this classification is without much basis in fact. For years I had roentgenologic friends watching for a case of what they could feel sure was atonic constipation, but they never found one for me. That is why, 40 years ago, I decided that the ancient division of constipated colons into the atonic and the spastic should be forgotten. As far as I can remember, it never helped anyone when treating constipation.— W. C. Alvarez, M.D., The Physiology of Constipation, *Diseases of the Colon & Rectum,* September-October, 1958.

INTOXICATION FROM PRIMIDONE DUE TO ITS BIOTRANSFORMATION TO PHENOBARBITAL

Gabriel L. Plaa, Ph.D., James M. Fujimoto, Ph.D.
and
Charles H. Hine, M.D., Ph.D., San Francisco

Primidone (Mysoline), 5-phenyl-5-ethylhexahydropyrimidine-4,6-dione, is an anticonvulsive agent which has been used successfully in the treatment of grand mal epilepsy and is reported to have controlled seizures in cases refractive to other anticonvulsant therapy. It is not an official drug, but was included in New and Nonofficial Remedies of 1957. It is marketed in oral tablets of 0.25 Gm.; the daily dose for adults is 0.5 to 1.5 Gm. It is a congener of phenobarbital, in that the oxygen on the second carbon has been reduced with hydrogen. In this respect it is similar to 2-dihydro 5,5-diphenylhydantoin, the congener of diphenylhydantoin, which was shown to be an effective anticonvulsant by Hine.[1]

Side-effects have been reported[2] to be more frequent than with phenobarbital and include the usual signs and symptoms of anticonvulsant drug toxicity, including dizziness, nausea, vomiting, ataxia, mood change, and pruritic rash. Toxic side-effects are stated to be controlled by reduction of dosage. However, its therapeutic status and toxic potentialities have not been entirely established. Its biotransformation in the body has not been completely elucidated, but a product identified as phenylethyl malonyl diamide has been identified in the urine of rodents receiving this compound, and recently Butler and Waddell[3] have published evidence that it is converted in part to phenobarbital in man and dog.

In the following report we are citing three cases of drug intoxication which have been observed in epileptics on a primidone regimen and suggest that the intoxication was principally due to the conversion of this compound in vivo to phenobarbital.

Case 1.—This 24-year-old housewife had had three previous admissions for diagnostic study, and had been followed in the outpatient clinic for a period of a year and a half. The symptoms 18 months previously were right-sided seizures with loss of consciousness. Electroencephalograms (EEG) repeated on several occasions were interpreted as being nonspecific; however, pneumoencephalograms suggested a space-consuming lesion in the left cerebrum. Her seizures had been partially controlled, being less frequent in number, with modification of the seizure pattern. Medication for the three months prior to the present admission included primidone, 250 mg. three times a day, and methoin (Mesantoin), 250 mg. in the morning.

On admission she was noted to be mentally confused, and she had a staggering gait, psychomotor retardation, and dysarthria. A bilateral horizontal nystagmus was noted, and anisocoria. Superficial reflexes were absent and knee and ankle jerks hypoactive. Other findings were not remarkable. EEG tracings appeared less stable than previously, and focal changes consisting of high-voltage irregularity and asynchronism appeared to center in the low frontal, procentral, and anterior temporal regions on the right. All medication was stopped on admission, and 24 hours later 5 ml. of blood was taken for drug analysis. The sample was analyzed by the method of Plaa and Hine.[4] The ultraviolet absorption curves after separation into the two fractions indicated the presence of a barbiturate and a hydantoin. Subsequent characterization of the barbiturate[5] indicated the presence of a compound with the ultraviolet characteristics of phenobarbital. The whole blood level of barbiturate was 4 mg. %. The hydantoin level was below that capable of quantitation by this method (0.2 mg. %). Four days later, the patient had become asymptomatic and free of her presenting signs and symptoms. The medication was readjusted to include diphenylhydantoin and mephobarbital (Mebaral).

Case 2.—This 8-year-old child was admitted to the pediatric service of the University of California Hospital in December with the chief complaint of seizures. These had first commenced at the age of 4 and had gradually increased in frequency until they were described as occurring "every few minutes" during waking hours, especially when the patient was inactive. Physical examination on admittance indicated a well-developed, thin, mildly retarded boy in no distress. The skin revealed a small abrasion of the left forehead and lower lip; enlarged cervical and inguinal lymph nodes were present; the skull revealed no deformity; the pupils were round, regular, equal, and reacted to light; extraocular movements were normal; fundi revealed no pathology. Neurological examination was physiological. Hemogram indicated hemoglobin level of 14 Gm. per 100 cc. and white blood cell count, 10,000 per cubic millimeter, the differential showing 25% eosinophils. Routine tuberculin and Schick tests were negative; repeated urine analysis was not remarkable, nor was lumbar puncture. Stools contained Endolimax nanacysts. Psychometric examination indicated a full-scale IQ of 65, according to the Wechsler intelligence scale for children.

During the first 45 days of the 65-day hospital course, seizures were frequent and difficult to control. Medication was repeatedly readjusted in an effort to arrive at an adequate combination. On the 46th hospital day, he was placed on therapy with primidone, 250 mg. twice a day, which was subsequently increased to three times a day; diphenylhydantoin was added to the regimen. On Feb. 7 an additional 125 mg. of primidone was given at bedtime; on Feb. 8 phensuximide (Milontin) was also given, 500 mg. three times a day. On Feb. 9 all therapy was discontinued, since ataxia and generalized incoordination indicated possible drug intoxication. The barbiturate level in the blood was 5.8 mg. % at this time, and the ultraviolet absorption characteristics again indicated phenobarbital.

Case 3.—This 4½-year-old boy was first admitted to the University of California Hospital in February. His chief complaint was convulsions. The history furnished by his mother indicated that there had been no neonatal complications and that he had been born after uncomplicated labor and delivery, weighing 7 lb. 12 oz. (3,515 Gm.). He had done well until six months previously, when he suddenly developed seizures characterized at first by foaming at the mouth and

---

From the Department of Pharmacology and Experimental Therapeutics, University of California School of Medicine. Drs. Plaa and Fujimoto are now at the Department of Pharmacology, Tulane University School of Medicine, New Orleans.

loss of consciousness for 15 to 30 seconds. The seizures occurred approximately 20 to 30 times a day. He was started on therapy with phenobarbital, which was replaced in a month's time by diphenylhydantoin, 50 mg. three times a day; trimethadione (Tridione), 50 mg. four times a day; and phenobarbital, 30 mg. four times a day. Convulsions increased in frequency, however, and he started having focal seizures involving the right side of his mouth and the right arm and leg. He had been hospitalized four months earlier in another hospital, where a pneumoencephalogram and skull x-ray did not clarify the clinical picture. He was maintained on therapy with the above drugs and did fairly poorly, having 10 to 12 seizures a day. A number of medicaments were tried with varying degrees of success. He had been on therapy with primidone, 750 mg. daily, phensuximide, 500 mg. daily, and phenobarbital 45 mg. daily, with restriction of salts and fluids, for two months prior to admission. During the past six weeks his speech had been slurred and he had been ataxic. He was referred for regulation of his medication and treatment of possible drug intoxication. He improved rapidly in the ward, and in one week's time his ataxia and slurred speech disappeared and he had no seizures. Blood analysis for therapeutic agents 24 hours after admission indicated the presence of a barbiturate. Ultraviolet absorption characteristics were similar to those of phenobarbital and the whole blood level was 4.0 mg. %.

Experimental Work

Since these findings indicated a possible biotransformation of primidone to a barbiturate resembling phenobarbital, limited experimental work was initiated to gather further evidence of this biotransformation. The ultraviolet characteristics of primidone excluded the possibility of interference by this compound with the absorption spectra of phenobarbital.

A group of rats was injected daily with 100 to 150 mg. of primidone and the urine was collected for five days. A portion of the urine was acidified and extracted several times with chloroform. The chloroform extracts were then combined and washed with phosphate buffer, pH 7.5. The chloroform was extracted with dilute sodium hydroxide; the alkaline extracts were acidified and further extracted with chloroform. The final chloroform extracts were evaporated to dryness. Paper chromatograms of the residue were prepared, according to the procedure of Algeri and Walker.[6] Subsequent contact ultraviolet photography of the dried chromatograms resulted in development of a spot in that position normally occupied by phenobarbital. Alkaline elution of this zone with subsequent determination of the ultraviolet spectra and absorbence ratios indicated that this zone contained a barbiturate with the ultraviolet characteristics of phenobarbital.[7]

Comment

Our data give good presumptive evidence that primidone is metabolized, in man and rats, to a barbiturate and that this barbiturate is, or closely resembles, phenobarbital. Our findings coupled with Butler's observation in man and dog[3] leave little doubt that the metabolite is phenobarbital.

Whenever a patient is treated on an ambulatory basis, there is a possibility that the patient had access to other drugs and is reluctant to admit their use. This possibility was present in cases 1 and 3. In case 2, however, the possibility that phenobarbital was ingested is absent, since the patient was hospitalized during the entire course of therapy with primidone.

From our own studies[8] on blood levels of phenobarbital in epileptics, we have found that the level determined in each of these cases is compatible with the signs of barbiturate intoxication. In case 3, the patient was taking 45 mg. of phenobarbital daily in addition to the primidone. However, by our methods of analysis this amount would be barely detectable normally (about 0.2 mg. %), consequently the 4.0 mg. % measured must be a reflection of the phenobarbital contribution from the biotransformation of the primidone (250 mg. three times a day).

In our opinion, the biotransformation of primidone to phenobarbital was the cause of the observed drug intoxication in these three cases. It was noted that the signs of toxicity did not occur on commencement of the regimen, but took a matter of weeks to develop. Whether this time lag reflects an accumulation of phenobarbital or an increased percentage transformation of primidone to phenobarbital remains to be elucidated. Whether the anticonvulsant properties of primidone are due to this biotransformation also remains to be determined.

Finally, we recommend that anticonvulsant regimens of primidone be evaluated by the physician in terms of the potential drug intoxication through its biotransformation to phenobarbital.

References

1. Hine, C. H.: Metabolism and Anticonvulsant Properties of Some Substituted Diphenylhydantoins, Thesis, University of Wisconsin, 1942.

2. Goodman, L. S., and Gilman, A.: Pharmacological Basis of Therapeutics: Textbook of Pharmacology, Toxicology, and Therapeutics for Physicians and Medical Students, ed. 2, New York, The Macmillan Company, 1955, pp. 200-201.

3. Butler, T. C., and Waddell, W. J.: Metabolic Conversion of Primidone (Mysoline) to Phenobarbital, Proc. Soc. Exper. Biol. & Med. **93:**544-546 (Dec.) 1956.

4. Plaa, G. L., and Hine, C. H.: Method for Simultaneous Determination of Phenobarbital and Diphenylhydantoin in Blood, J. Lab. & Clin. Med. **47:**649-657 (April) 1956.

5. Goldbaum, L. R.: Determination of Barbiturates: Ultraviolet Spectrophotometric Method with Differentiation of Several Barbiturates, Analyt. Chem. **24:**1604-1607 (Oct.) 1952.

6. Algeri, E. J., and Walker, J. T.: Paper Chromatography for Identification of Common Barbiturates, Am. J. Clin. Path. **22:**37-40 (Jan.) 1952.

7. Plaa, G. L.; Hall, F. B.; and Hine, C. H.: Differentiation of Barbiturates for Clinical and Medicolegal Purposes, J. Forensic Sc.**3:**201-209 (April) 1958.

8. Plaa, G. L.; Hine, C. H.; and Nelson, T. L.: Blood Levels of Hydantoins and Phenobarbital in Epileptics, abstracted, Fed. Proc. **15:**467-468 (March) 1956.

COUNCIL ON DRUGS

NEW AND NONOFFICIAL DRUGS

Monographs and supplemental statements on drugs described here and in subsequent editions of New and Nonofficial Drugs are based on the evaluation of available scientific data and reports of investigations.

H. D. Kautz, M.D., *Secretary*.

Rabies Vaccine (Duck Embryo).—A sterile, freeze-dried suspension of killed rabies virus prepared from whole duck embryo infected with this virus, chemically inactivated, and preserved with 1:10,000 thimerosal. Rabies vaccine (duck embryo) is standardized for potency by active immunization of mice according to specifications of the National Institutes of Health.

Actions and Uses.—Rabies vaccine (duck embryo) is used prophylactically for active immunization against rabies, usually during the incubation period after exposure. Its immunizing capacity compares favorably with that of older vaccines prepared from animal nervous tissue; prompt antibody responses are produced after subcutaneous injection of the duck embryo preparation. The indications for or against giving rabies vaccine frequently are difficult to define because of the impossibility of determining what exposure has actually occurred. In determining whether to institute vaccine therapy, the following factors should be taken into consideration, as opposed to the risk of paralytic or other complications from the vaccine itself: 1. Approximately 20% of persons bitten by animals known to be rabid have developed rabies if not treated with rabies vaccine. 2. If clinical symptoms of rabies develop, the disease is 100% fatal; there is no specific therapy. 3. Rabies rarely occurs unless the person actually has been bitten by the animal. The need for treatment must be weighed against the risk of the treatment itself. In general, the management of patients exposed to supposedly rabid animals should follow the recommendations set forth by the Expert Committee on Rabies of the World Health Organization (WHO Technical Report Series, No. 121, 1957).

Aside from the inconvenience of daily injections and the occurrence of local reactions, the principal deterrent to the use of the older nervous tissue vaccines has been the danger of severe neurological or paralytic phenomena. These have included peripheral neuritis, dorsolumbar myelitis, and acute ascending spinal paralysis. Such reactions result from sensitization to foreign brain tissue rather than from sensitization to the fixed virus antigen. Since experiments have shown that duck embryo tissue contains little, if any, of the "paralytic factor," it is believed that the danger of neurological side-effects is materially reduced by the use of the duck embryo vaccine.

Mild to severe local erythematous reactions have been observed in about one-third of the patients to whom rabies vaccine (duck embryo) has been administered. In addition to the local erythema, patients may exhibit inflammation and induration at the site of injection, regional lymphadenopathy, and, occasionally, giant urticaria. Much more rarely, a systemic type of reaction characterized by malaise, febrile episodes, and chills may be observed. Although cross sensitization between duck protein and chicken protein is rare, caution should be observed in administering the duck embryo vaccine to persons known to be sensitive to egg, chicken, or chicken feathers. From the standpoint of overall clinical safety, the duck embryo vaccine is considered to be a decided improvement over the older rabies vaccines prepared from the nervous tissue of animals.

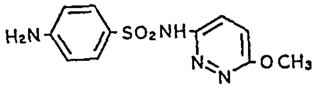
Dosage.—Rabies vaccine (duck embryo) is administered subcutaneously. The freeze-dried powder is mixed with sterile water for injection; 1 cc. of the resulting suspension is injected beneath the skin of the abdomen each day for 14 days. A 23-gauge or 24-gauge needle, approximately one-half to three-fourths inches long, should be used and the site of injection varied for each dose.

Preparations: powder (injection) yielding one dose with 1 cc. of sterile diluent.

Applicable commercial name: Rabies Vaccine (Duck Embryo).

Eli Lilly & Company cooperated by furnishing scientific data to aid in the evaluation of rabies vaccine (duck embryo).

Sulfamethoxypyridazine.—N ^{1}-(6-Methoxy-3-pyridazinyl)sulfanilamide.—3-Sulfanilamido-6-methoxypyridazine.—The structural formula of sulfamethoxypyridazine may be represented as follows:



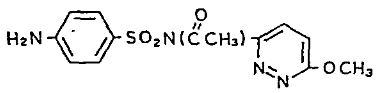
Actions and Uses.—Sulfamethoxypyridazine is of value for the chemotherapy of urinary tract infections and systemic infections due to micro-organisms susceptible to the bacteriostatic action of sulfonamides. The drug is rapidly absorbed from the gastrointestinal tract and is conjugated to a minimal degree in the body; 40 to 70% of the total blood sulfonamide is present in the acetylated form; 30 to 60% of the administered dose is excreted in the urine in the free form. Sulfamethoxypyridazine is distinguished from other sulfonamides by its exceptionally slow rate of excretion. Maximum blood levels are reached within a few hours after the oral administration of 1 Gm., and this high level is maintained for about 10 hours. Thereafter, blood levels fall slowly; at the end of 24 to 48 hours, blood levels are about half of the maximum. After 96 hours they reach one-eighth to one-fourth the maximum levels. Because of this long duration of action, lower dosage and less frequent administration are required than with other sulfonamides.

Except for a diminished incidence of renal toxicity, the same general type of side-effects and untoward reactions may be expected with sulfamethoxypyridazine as with other sulfonamides. Hence, the drug should be used with the same precautions and is subject to the same contraindications as other agents of this class. (See the general statement on sulfonamides in New and Nonofficial Drugs.)

Dosage.—Sulfamethoxypyridazine is administered orally. Since it produces high, prolonged blood levels, it is imperative that the recommended doses, which are much lower than with other sulfonamides, are not exceeded. For mild to moderate infections, the initial dose for adults is 1 Gm. the first day, followed by 500 mg. every day thereafter or 1 Gm. every other day. In severe infections, as much as 2 Gm. may be given to adults on the first day, followed by 500 mg. every 24 hours. Dosage for children is reduced in proportion to body weight. Therapy should be continued for five to seven days or until the patient is asymptomatic for 48 to 72 hours.

Preparations: tablets 500 mg.
Applicable commercial names: Kynex, Midicel.
Lederle Laboratories Division, American Cyanamid Company, cooperated by furnishing scientific data to aid in the evaluation of sulfamethoxypyridazine.

Acetyl Sulfamethoxypyridazine. — N^1-Acetyl-N^1-(6-methoxy-3-pyridazinyl)sulfanilamide. — 3-(N^1-Acetylsulfanilamido)-6-methoxypyridazine. — The structural formula of acetyl sulfamethoxypyridazine may be represented as follows:

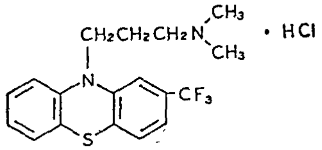


Actions and Uses.—Acetyl sulfamethoxypyridazine has the same actions and uses as the parent sulfonamide, sulfamethoxypyridazine, except that it is tasteless and is therefore better suited to pediatric use as a liquid medication. (See the monograph on sulfamethoxypyridazine.)

Dosage.—Acetyl sulfamethoxypyridazine is administered orally. The dose for children is 250 mg. for each 20 lb. (9 kg.) of body weight and is given immediately after a meal on the first day. Thereafter, the dose is 125 mg. per 20 lb. of body weight, given immediately after a meal once daily or, alternatively, 250 mg. per 20 lb. of body weight every other day. For children weighing 80 lb. (36.3 kg.) or more and for adults, the dose of acetyl sulfamethoxypyridazine is the same as for the unacetylated drug, sulfamethoxypyridazine.

Preparations: suspension (oral) 25 mg. per cc.
Applicable commercial name: Kynex Acetyl.
Lederle Laboratories Division, American Cyanamid Company, cooperated by furnishing scientific data to aid in the evaluation of acetyl sulfamethoxypyridazine.

Triflupromazine Hydrochloride. — 10-(3-Dimethylaminopropyl)-2-(trifluoromethyl)phenothiazine hydrochloride.—The structural formula of triflupromazine hydrochloride may be represented as follows:



Actions and Uses.—Triflupromazine hydrochloride is identical in chemical structure to chlorpromazine hydrochloride except that it contains a trifluoromethyl group rather than a chlorine atom at the 2 position of the phenothiazine ring. It is perhaps more closely allied in actions and uses to chlorpromazine than any of the other phenothiazine derivatives currently in use. Equivalent pharmacological and clinical responses can be elicited with doses of triflupromazine that are less than those of chlorpromazine, thus indicating a greater potency for the former compound.

Triflupromazine is useful as an adjunct to the management of various acute and chronic psychoses, particularly those associated with excessive psychomotor activity and overt hostility as in schizophrenia, mania, senile and toxic psychoses, and in alcoholism. The drug is reported to ameliorate such psychic symptoms as hallucinations and delusions and to control agitation, anxiety, tension, panic, hostility, and aggressiveness in appropriate cases. It is also of value in facilitating rapport with the psychiatrist and making the patient more amenable to psychotherapy. The drug should not be given to patients with depressive-obsessive states, nor is it intended for use in simple neuroses or relatively minor emotional disorders. In common with other phenothiazine compounds, triflupromazine exerts a significant antiemetic effect and is effective for the control of nausea and vomiting of varied etiologies.

In general, triflupromazine seems to compare well with chlorpromazine, with respect to the overall incidence of side-effects and untoward reactions. Phenothiazine-induced jaundice associated with triflupromazine has been exceptionally rare. Only one reported instance of granulocytopenia associated with the administration of triflupromazine has been reported. In view of the phenothiazine structure of triflupromazine, physicians using this drug should be alert to signs of hematopoietic depression; routine blood cell counts are advisable during therapy. Excessive sedation and drowsiness are apparently less with triflupromazine than with chlorpromazine; hypotension and tachycardia may also occur somewhat less frequently. The most common side-effect to the drug is a parkinsonian syndrome, with motor disturbances and extrapyramidal symptoms. This reaction generally subsides upon reduction in dosage and/or administration of an antiparkinsonian drug. Other reported side-effects include blurring of vision, dizziness, nausea, epigastric distress, weakness, weight gain, insomnia, allergic reactions, and photosensitivity. Triflupromazine is contraindicated in patients under the influence of large amounts of alcohol, barbiturates, or opiates.

Dosage.—Triflupromazine hydrochloride is administered orally and, occasionally, intramuscularly or intravenously. Optimal dosage varies from patient to patient and should be determined on an individual basis. For adults, the usual initial oral dose is 25 mg. three times daily. This dose may then be increased gradually until a satisfactory clinical response has been obtained or until side-effects become a problem. For children and geriatric patients, the usual oral dose is 10 mg. three times a day.

For rapid effect in severely agitated patients or in severe nausea and vomiting, triflupromazine hydrochloride may be given parenterally. Dosage by the intramuscular route ranges from 20 to 50 mg. three times a day; single intravenous doses range from 2 to 10 mg. Oral therapy should be substituted for parenteral injection as soon as feasible.

Preparations: emulsion (oral) 10 mg. per cc.; solution (injection) 20 mg. in 1 cc.; tablets 10, 25, and 50 mg.

Applicable commercial name: Vesprin.

E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of triflupromazine hydrochloride.

Use of Nicotinic Acid in Hypercholesteremia

The Council was requested to evaluate the usefulness and safety of large oral doses of the vitamin, nicotinic acid (Niacin), for the treatment of hypercholesteremia. The rationale for such use of the drug stems from the statistical relationship which is commonly accepted to exist between elevated serum cholesterol levels and the clinical manifestations of atherosclerosis. There seems to be little doubt that nicotinic acid, when given in large doses to hypercholesteremic subjects, will frequently bring about a marked reduction in cholesterol levels; the lowering of cholesterol is less impressive in subjects with normal or near normal levels. Theoretically, sustained reduction of circulating cholesterol levels appears to be desirable. However, to date, there is no valid evidence that lowered blood cholesterol levels cause clinical improvement of the patient. Although the large doses of nicotinic acid (3 to 6 Gm. per day) employed for the treatment of hypercholesteremia have not been associated with serious toxic effects, the possibility of adverse reactions should be kept in mind. Pending the accumulation of evidence to show a bona fide beneficial effect in patients, either from the viewpoint of prophylaxis or therapy of atherosclerotic cardiovascular disease, the use of nicotinic acid for purposes other than the prevention or treatment of pellagra must be considered experimental.

The Council voted to expand New and Nonofficial Drugs to describe the use of nicotinic acid in hypercholesteremia.

Eli Lilly & Company cooperated by furnishing scientific data to aid in the evaluation of this additional use of nicotinic acid.

INCREASING IMPORTANCE OF INFECTION AFTER BURNS.—A review was made of the cases of 93 patients with burns covering more than 20 per cent of the body surface who were treated at the San Francisco City and County Hospital, University of California Service, between 1943 and 1956. The mortality rate increased from 40 per cent during 1943-1947 to 69 per cent during 1952-1956. A significant change in survival time was noted: During 1943-1947, 69 per cent of the deaths occurred within 48 hours of admission; during 1952-1956, only 19 per cent of the deaths occurred within the first 48 hours. In the period 1943-1947 the majority of deaths resulted from shock in the immediate post-burn period; in the later years of the study the major cause of death was infection. . . . No patient who had a blood culture positive for bacteria survived. The use of antibiotics had no effect on the incidence of infection. Elderly patients, children and alcoholics were less able to resist the effects of infection.—A. G. Clark, M.D., and J. H. Hanson, M.D., Mortality Rates in Patients with Burns: A Report of Experience at San Francisco City and County Hospital, 1943-1956, *California Medicine*, September, 1958.

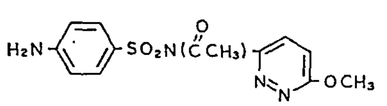
isms susceptible to the bacteriostatic action of sulfonamides. The drug is rapidly absorbed from the gastrointestinal tract and is conjugated to a minimal degree in the body; 40 to 70% of the total blood sulfonamide is present in the acetylated form; 30 to 60% of the administered dose is excreted in the urine in the free form. Sulfamethoxypyridazine is distinguished from other sulfonamides by its exceptionally slow rate of excretion. Maximum blood levels are reached within a few hours after the oral administration of 1 Gm., and this high level is maintained for about 10 hours. Thereafter, blood levels fall slowly; at the end of 24 to 48 hours, blood levels are about half of the maximum. After 96 hours they reach one-eighth to one-fourth the maximum levels. Because of this long duration of action, lower dosage and less frequent administration are required than with other sulfonamides.

Except for a diminished incidence of renal toxicity, the same general type of side-effects and untoward reactions may be expected with sulfamethoxypyridazine as with other sulfonamides. Hence, the drug should be used with the same precautions and is subject to the same contraindications as other agents of this class. (See the general statement on sulfonamides in New and Nonofficial Drugs.)

Dosage.—Sulfamethoxypyridazine is administered orally. Since it produces high, prolonged blood levels, it is imperative that the recommended doses, which are much lower than with other sulfonamides, are not exceeded. For mild to moderate infections, the initial dose for adults is 1 Gm. the first day, followed by 500 mg. every day thereafter or 1 Gm. every other day. In severe infections, as much as 2 Gm. may be given to adults on the first day, followed by 500 mg. every 24 hours. Dosage for children is reduced in proportion to body weight. Therapy should be continued for five to seven days or until the patient is asymptomatic for 48 to 72 hours.

Preparations: tablets 500 mg.
Applicable commercial names: Kynex, Midicel.
Lederle Laboratories Division, American Cyanamid Company, cooperated by furnishing scientific data to aid in the evaluation of sulfamethoxypyridazine.

Acetyl Sulfamethoxypyridazine. — N^1-Acetyl-N^1-(6-methoxy-3-pyridazinyl)sulfanilamide. — 3-(N^1-Acetylsulfanilamido)-6-methoxypyridazine. — The structural formula of acetyl sulfamethoxypyridazine may be represented as follows:

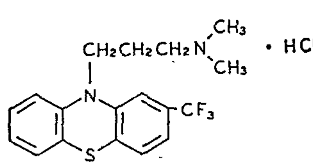


Actions and Uses.—Acetyl sulfamethoxypyridazine has the same actions and uses as the parent sulfonamide, sulfamethoxypyridazine, except that it is tasteless and is therefore better suited to pediatric use as a liquid medication. (See the monograph on sulfamethoxypyridazine.)

Dosage.—Acetyl sulfamethoxypyridazine is administered orally. The dose for children is 250 mg. for each 20 lb. (9 kg.) of body weight and is given immediately after a meal on the first day. Thereafter, the dose is 125 mg. per 20 lb. of body weight, given immediately after a meal once daily or, alternatively, 250 mg. per 20 lb. of body weight every other day. For children weighing 80 lb. (36.3 kg.) or more and for adults, the dose of acetyl sulfamethoxypyridazine is the same as for the unacetylated drug, sulfamethoxypyridazine.

Preparations: suspension (oral) 25 mg. per cc.
Applicable commercial name: Kynex Acetyl.
Lederle Laboratories Division, American Cyanamid Company, cooperated by furnishing scientific data to aid in the evaluation of acetyl sulfamethoxypyridazine.

Triflupromazine Hydrochloride. — 10-(3-Dimethylaminopropyl)-2-(trifluoromethyl)phenothiazine hydrochloride.—The structural formula of triflupromazine hydrochloride may be represented as follows:



Actions and Uses.—Triflupromazine hydrochloride is identical in chemical structure to chlorpromazine hydrochloride except that it contains a trifluoromethyl group rather than a chlorine atom at the 2 position of the phenothiazine ring. It is perhaps more closely allied in actions and uses to chlorpromazine than any of the other phenothiazine derivatives currently in use. Equivalent pharmacological and clinical responses can be elicited with doses of triflupromazine that are less than those of chlorpromazine, thus indicating a greater potency for the former compound.

Triflupromazine is useful as an adjunct to the management of various acute and chronic psychoses, particularly those associated with excessive psychomotor activity and overt hostility as in schizophrenia, mania, senile and toxic psychoses, and in alcoholism. The drug is reported to ameliorate such psychic symptoms as hallucinations and delusions and to control agitation, anxiety, tension, panic, hostility, and aggressiveness in appropriate cases. It is also of value in facilitating rapport with the psychiatrist and making the patient more amenable to psychotherapy. The drug should not be given to patients with depressive-obsessive states, nor is it intended for use in simple neuroses or relatively minor emotional disorders. In common with other phenothiazine compounds, triflupromazine exerts a significant antiemetic effect and is effective for the control of nausea and vomiting of varied etiologies.

In general, triflupromazine seems to compare well with chlorpromazine, with respect to the over-all incidence of side-effects and untoward reactions. Phenothiazine-induced jaundice associated with triflupromazine has been exceptionally rare. Only one reported instance of granulocytopenia associated with the administration of triflupromazine has been reported. In view of the phenothiazine structure of triflupromazine, physicians using this drug should be alert to signs of hematopoietic depression; routine blood cell counts are advisable during therapy. Excessive sedation and drowsiness are apparently less with triflupromazine than with chlorpromazine; hypotension and tachycardia may also occur somewhat less frequently. The most common side-effect to the drug is a parkinsonian syndrome, with motor disturbances and extrapyramidal symptoms. This reaction generally subsides upon reduction in dosage and/or administration of an antiparkinsonian drug. Other reported side-effects include blurring of vision, dizziness, nausea, epigastric distress, weakness, weight gain, insomnia, allergic reactions, and photosensitivity. Triflupromazine is contraindicated in patients under the influence of large amounts of alcohol, barbiturates, or opiates.

Dosage.—Triflupromazine hydrochloride is administered orally and, occasionally, intramuscularly or intravenously. Optimal dosage varies from patient to patient and should be determined on an individual basis. For adults, the usual initial oral dose is 25 mg. three times daily. This dose may then be increased gradually until a satisfactory clinical response has been obtained or until side-effects become a problem. For children and geriatric patients, the usual oral dose is 10 mg. three times a day.

For rapid effect in severely agitated patients or in severe nausea and vomiting, triflupromazine hydrochloride may be given parenterally. Dosage by the intramuscular route ranges from 20 to 50 mg. three times a day; single intravenous doses range from 2 to 10 mg. Oral therapy should be substituted for parenteral injection as soon as feasible.

Preparations: emulsion (oral) 10 mg. per cc.; solution (injection) 20 mg. in 1 cc.; tablets 10, 25, and 50 mg.

Applicable commercial name: Vesprin.

E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of triflupromazine hydrochloride.

Use of Nicotinic Acid in Hypercholesteremia

The Council was requested to evaluate the usefulness and safety of large oral doses of the vitamin, nicotinic acid (Niacin), for the treatment of hypercholesteremia. The rationale for such use of the drug stems from the statistical relationship which is commonly accepted to exist between elevated serum cholesterol levels and the clinical manifestations of atherosclerosis. There seems to be little doubt that nicotinic acid, when given in large doses to hypercholesteremic subjects, will frequently bring about a marked reduction in cholesterol levels; the lowering of cholesterol is less impressive in subjects with normal or near normal levels. Theoretically, sustained reduction of circulating cholesterol levels appears to be desirable. However, to date, there is no valid evidence that lowered blood cholesterol levels cause clinical improvement of the patient. Although the large doses of nicotinic acid (3 to 6 Gm. per day) employed for the treatment of hypercholesteremia have not been associated with serious toxic effects, the possibility of adverse reactions should be kept in mind. Pending the accumulation of evidence to show a bona fide beneficial effect in patients, either from the viewpoint of prophylaxis or therapy of atherosclerotic cardiovascular disease, the use of nicotinic acid for purposes other than the prevention or treatment of pellagra must be considered experimental.

The Council voted to expand New and Nonofficial Drugs to describe the use of nicotinic acid in hypercholesteremia.

Eli Lilly & Company cooperated by furnishing scientific data to aid in the evaluation of this additional use of nicotinic acid.

INCREASING IMPORTANCE OF INFECTION AFTER BURNS.—A review was made of the cases of 93 patients with burns covering more than 20 per cent of the body surface who were treated at the San Francisco City and County Hospital, University of California Service, between 1943 and 1956. The mortality rate increased from 40 per cent during 1943-1947 to 69 per cent during 1952-1956. A significant change in survival time was noted: During 1943-1947, 69 per cent of the deaths occurred within 48 hours of admission; during 1952-1956, only 19 per cent of the deaths occurred within the first 48 hours. In the period 1943-1947 the majority of deaths resulted from shock in the immediate post-burn period; in the later years of the study the major cause of death was infection. . . . No patient who had a blood culture positive for bacteria survived. The use of antibiotics had no effect on the incidence of infection. Elderly patients, children and alcoholics were less able to resist the effects of infection.—A. G. Clark, M.D., and J. H. Hanson, M.D., Mortality Rates in Patients with Burns: A Report of Experience at San Francisco City and County Hospital, 1943-1956, *California Medicine*, September, 1958.

COUNCIL ON FOODS AND NUTRITION

The following is one of the six papers presented at the symposium on "Nutrition in Pregnancy" in Columbia, Mo., Oct. 11, 1957. This symposium was sponsored by the Council on Foods and Nutrition, with the cooperation of the Boone County Medical Society, the University of Missouri School of Medicine, and the Adult Education and Extension Service of the University of Missouri.

PHILIP L. WHITE, SC.D., *Secretary,*
Council on Foods and Nutrition.

MATERNAL NUTRITION AND THE FETUS

Ray Hepner, M.D., Columbia, Mo.

Each generation has a genetic and environmental background of experience, even at birth. The constant improvement in livestock production has proved the practicality of research applied to reproductive problems in mammals. Human losses in the newborn period are now the third leading medical cause of death in the United States, and these statistics exclude stillbirth, miscarriage, and surviving damaged children. When prematurity, stillbirth, and the great tragedy, the surviving damaged child, are considered, together with unnecessary maternal illness and morbidity or death of liveborn children, we find ourselves faced with an immensely complex, yet perfectly interrelated, problem. No doubt exists about the role of nutrition in the problem, but solid evidence to support this belief has been singularly difficult to marshal. This presentation offers, first, some of the difficulties in studying the problem; second, the results of some studies of the past; and, third, some incompletely developed, yet fundamental concepts.

It is axiomatic that fetal problems are the best index to obstetric practice. This index may be as confined as the neonatal death rate alone, or, and perhaps more properly, it may be as broad as the entire gamut of reproductive problems. This gamut ranges from sterility, pregnancy and labor complications, miscarriage, premature and immature birth, stillbirth, and malformation to a functional abnormality that may become manifest well beyond the newborn period in the form of convulsions, defects of intellect, and neuromuscular disturbances.[1] These latter defects are known to the laity as epilepsy, feeblemindedness, and cerebral palsy, and, by the most conservative estimates, persons so affected make up at least 1% of our population today. Every indication is that this proportion will increase if the present production and survival rates of these children prevail.

Many studies have shown that nutrition plays a part in reproductive problems. Observations of war starvation in pregnancy,[2] of nutrition surveys in pregnancy,[3] of patients admitted to sterility and other special clinics, and of controlled animal investigations affirm this part.[4] A sufficient degree of starvation will cause sterility and amenorrhea that will not respond to adequate caloric intake until sufficient protein is provided. Attempts to reduce stillbirth, premature birth, malformations, and neonatal death in special prenatal clinics are impressive when one sees how much can be done to help the individual mothers of each group in which a nutritional deficit is demonstrated. For instance, the sterile mother can be helped to conceive; the habitual aborter can be helped to carry a child to viability; the repeated bearer of stillborn infants can be helped to have a living child.

Even with these known and measurable accomplishments, there is little change in the total statistical results in each hospital. The failure of statistics to improve may well be due to the use of an improper base line, one that is chased from one category to the next. To compare the incidence of premature birth with total viable births fails entirely to recognize those women who have conceived who did not conceive before, those who have carried a fetus to viability who could not before, and those who carried their fetuses to term who never did before. Our statistical base line might better be placed on a level with the reproductive group as a whole than compared with the final result, which, after all, is a goal to be achieved and not the point at which to begin. For a baby to be born alive at term and go home with its mother is not enough. Real success must be measured by achievement of the potential to become a contributing member of society.

Children handicapped by convulsions, neuromuscular problems, or a mental deficiency are born commonly to mothers with reproductive histories of sterility, miscarriage, stillbirth, pregnancy complications, premature or immature birth, and malformation. The prevailing view has been that this relationship is based on genetic fault.[5] Good evidence is available now which shows that inadequate nutrition can produce defects of function as

---

From the Department of Pediatrics, University of Missouri Medical Center.

well as of structure.[6] Nutritional deficiencies may be related to any of the entire gamut of reproductive problems.

General Factors Influencing Reproduction

Apparently unrelated agents may produce injuries similar to those produced by a nutritional deficit. Trace elements, as well as major minerals, insulin, some infectious diseases, various corticoids, hypoxia, hyperoxia, vitamin excesses and deficiencies, and genetic faults can influence the reproductive spectrum. Repeated demonstrations both in man and in controlled animal experiments have shown that identical, or nearly identical, abnormalities may result from entirely different agents. A classic example in humans is found in the microcephalia of genetic fault and pelvic x-irradiation. In animals, the demonstration of identical bony defects in rats injured by riboflavin deficiency, x-irradiation, or inbreeding serves admirably for illustration.[7] Although different injurious agents may operate finally through similar pathways, the initiating agent remains different. Even so, the contributions of adequate nutritive stores may protect the organism against a considerable onslaught.

Nutritional Factors Influencing Reproduction

The concepts of timing, severity, type, and duration of nutritional deficit are of major import, since these factors often determine what part of the reproductive gamut is to be affected. In humans, acute starvation with protein depletion over a short period has been proved to be associated with a decrease in conception rate, and sterility with amenorrhea is produced over a longer starvation period. If acute depletion begins after conception, the babies are small. However, only inconclusive evidence of an increased incidence of malformation could be found in a previously well-nourished population.[2a] Some evidence of increased reproductive problems can be found in several studies of humans living on chronically poor diets, particularly when the stress of continued growth and the depletion of repeated pregnancy are added burdens.[3] These patients run the gamut of reproductive problems. On the basis of insufficient amounts and variety of good quality foods, these diets were assessed as poor, even though sufficient (and often more than sufficient) calories were provided. The frequency of obesity in the patients of these studies suggested the aphorism "overfed and undernourished," and the offspring of these women, when compared with controls, suffered as well.

In several animals, vitamin A deficiency is associated with sterility, abortion, malformation, stillbirth, or small young, depending on the duration, severity, and timing of the deficiency.[8] In rats, similar effects have been produced by deficiencies of pure thiamine, riboflavin, pyridoxine, or pantothenic acid without protein deficiency.[9]

Results of Past Studies

More than one-third of lethal human malformations involve the nervous system. However, many anomalies of the nervous system are compatible with life. Brain function is often seriously disturbed, with little or no demonstrable structural abnormality. For many years speculation has been forwarded that agents known to produce structural alteration with related defects of function might, in smaller doses, produce defects of function without histological abnormality.

In 1951 Whitely, O'Dell, and Hogan[6a] demonstrated that folic acid deficiency in pregnant rats could disturb the ability of the offspring to learn a standard maze, even though brain structure was apparently normal. More recently, doses of x-irradiation, smaller than necessary to produce anomalies of the nervous system of fetal rats, have produced similar results. Again, different agents have been proved able to produce a similar defect, but this defect is one of function rather than of structure.

The recent study of Harrell, Woodyard, and Gates[6b] is of special interest for two reasons. The first is that their assay of results was based on significant differences in intellectual performance of human offspring, a function that might be damaged even in the absence of a gross anatomic abnormality. Second, the dietary supplements used were thiamine, riboflavin, niacinamide, and iron—factors almost invariably missing from poor diets, particularly those poor in protein. This experiment, then, might tend to separate the effects of poor diet from the effects of the trace materials found in good foods. Unfortunately, no data are available about other differences in results in the two groups. Furthermore, supplementation was offered late in pregnancy, and only the latter parts of gestation could be affected. Even so, this approach, if verified, may have some practicality, in that food fortification is easier than changing the dietary habits of an entire population, although the latter method is unquestionably superior.

Interrelationship of Factors Affecting the Fetus

The interdependence of the many agents known to affect the embryo and fetus is more apparent as investigation continues. Our knowledge of antagonism, competition, and interrelationships of drugs, hormones, chromosomal determinants, enzymes, trace elements, amino acids, and vitamins is broadening rapidly. The assurance of balance in dietary supplementation by high quality foods is great, whereas the principal assurance of supplementation by single factors is that imbalance is to be expected.

Interrelationship of Nutritive Factors

Long ago it was said that no professor's hemispheres could supply adequate nutrition to the infant as well as the mother's own mammary hemispheres. Perhaps this remark is the clinician's way of saying that the demands of growth reveal rapidly almost any defect of nutrition. Although the pregnant woman ingests foods not only to maintain herself but to store some elements and support the growth of her uterus, placenta, membranes, and baby, it is the baby who, once out of the uterus, has the greatest demands and serves as the best example. Although artificial feeding of human infants is safe today, and the results are comparable with natural feeding, the history of difficulties in preparation of safe, adequate substitutes for natural feeding is punctuated by difficulties with anemia, digestibility, increased susceptibility to rickets and to infections, chloride acidosis, hyperphosphatemia, tetany, and pyridoxine deficiency. Debate on the various constituents of artificial feedings continues. No doubt exists about the value of controversy backed by careful observation of controlled studies. Our need is for properly developed and properly challenged evidence. In the entire field of nutrition, good evidence, at least so far, is slow to unfold and not easy to interpret. The principal lessons to be learned by surveying the mass of new information on interrelationships of nutritive factors are a humble respect for nutritive balance in foods and a healthy skepticism of indiscriminate administration of single supplements.

Dietary Problems in the United States

Although our food consumption as a nation statistically proves us to have the best fed population on earth, and although surveys of nutrition in pregnancy in the United States are commonly negative because of an insufficient number of ill-nourished mothers, some segments of our childbearing population take borderline or lesser amounts of high quality foods. The incidence of abnormalities in the reproductive gamut of these people has been increased; however, some studies [10] indicate that it may be reducible by dietary supplementation. At least four barriers to easing the problem exist: eating habits passed from generation to generation; high cost of some commonly recommended, good quality foods; social pressures from companions; and ineffective lay education. Several studies have shown that, even with marked improvement of economic status, poor dietary habits tend to persist.[11] It is true that some commonly recommended, high quality foods, particularly animal protein, are more expensive; however, a casual stroll through a grocery store can be reassuring. A quart of whole milk costs about the same as a carton of six small bottles of carbonated beverage, and dry skim milk is still less expensive. The same weight of standard brands of peanut butter versus jelly or jam sells for the same price. Perhaps some of the social pressures on the prematernal group compound the problem. The popularity of the soft drink–chips–candy bar luncheon and snack and the current demands of clothing styles for extreme slenderness can wreak nutritional havoc on the prematernal teen-ager, who is pressed on the one hand by growth needs and on the other by the demands of pregnancy. Some realistic competition could be given the pop-and-chips regimen by milk dispensers; fruit, sandwich, and low-priced nut dispensers could compete with candy bar, chewing gum, and chips machines. These competitive devices exist and are occasionally observed in commercial use on the American scene. An effective program of lay education could make the battle of the commercial machines at least self-supporting and, even better, begin to break some poor patterns of eating at home. A more effective program of lay education is needed. Skilled personnel trained to break the inertia of the problem need to be found, and medical school programs must, because of the place of the physician in society, lead this nurture of the prophylactic concepts of reproduction, growth and development, and health and environment.

Role of Placenta in Fetal Problems

Evidence of the effect of maternal nutrition on the fetus is often studied, but the connecting link between mother and fetus, the placenta, has had little attention. We examine the mother by indirection, the fetus as allowed, and leave the all-important conveyor in dim light. The placentas of women with renal disease, hypertension, diabetes, and true toxemia are often abnormal, and the fetuses of these pregnancies are known, by any criterion, to have problems. The role of the placenta in true toxemia of pregnancy still is debated, even as a possible cause, and the role of the placenta in the fetal problems of abnormal pregnancy has received little consideration. Therefore, it is not unexpected that scanty mention has been made of placenta abnormalities in otherwise normal pregnancies producing abnormal fetuses. The concept that placental insufficiency is responsible for the syndrome o postmaturity has aroused interest.[12] Flexner and co-workers [13] reported marked differences in placental blood flow in various abnormal pregnancy states. Recent observations suggest that, because o intrauterine malnutrition, placental abnormalitie per se may play a role in some instances of pre maturity and immaturity.[14] It might seem justified to speculate that abnormalities of placental func tion may be of far greater significance than so fa supposed.

Problems in Classifying Neonates

The newborn infant is judged by the crudes methods. Marked individual differences in so-called normal infants are found, and none but the grosse structural abnormalities, particularly the important ones of the cardiac, renal, and nervous systems, are identifiable during the neonatal period. Although weight is used as a standard reference point, it is a poor index whether used for maturity, growth, or body composition. The wide variability of total body water in the newborn infant has been demonstrated by Friis-Hansen,[15] but no general agreement about the significance of this variability has been reached by clinicians. Little use has been made of normal growth curves for length in early life, even though serial measurement of length is a better index of true growth. In addition, the pitfalls of differing body composition are excluded. Good methods for estimating iron stores of the individual infant are lacking, and no safe, practical, and generally accepted means of estimating calcium stores or body protein mass in the newborn infant are available. Tedious individual studies of small numbers of infants have recorded large individual differences in retentions of these basic substances. These various differences serve to underline some of our inadequacies to judge the newborn infant, even under the best of circumstances. Pregnancy histories including incidence of anemia, toxemia, and premature births, age of mother, number of pregnancies, and defective dietary habits are useful for planning each infant's nutritional management, but they can only be used circuitously to judge the adequacy of the gestation by its product. Repeated examinations through the first years of life, with special attention to linear growth and the rapid development of the nervous system in all its functions, are needed before an accurate opinion of an infant can be made. However, this opinion fails to separate the intrauterine from the extrauterine factors. Practical methods and normal standards must be established to provide a meaningful classification of infants in the newborn period.

Summary

Loss of human life in the newborn period is the third leading medical cause of death in the United States. The problems of reproduction—sterility and abortion, premature or immature birth and stillbirth, toxemia, labor problems, anemia in the mother during pregnancy and, in the first year, in the offspring, as well as malformations and neurological disorders of function—can be related and considered together.

Prematurity, immaturity, surviving malformed children, unnecessary maternal illness during pregnancy and puerperium (including failure of natural feeding) make a tremendous and, in large part, needless burden. Some neurological defects in children, the convulsive, mentally deficient, and so-called cerebral palsied, may be related to nutritional factors, and human and animal studies suggest that all defects enumerated here can arise from nutritional deficiencies. However, injurious agents other than nutritional deficiencies can produce reproductive problems indistinguishable from those of nutritional origin. The same deficit of nutrition may produce many different effects on the reproductive gamut, depending on timing, severity, and duration of the deficit.

No single element of nutrition holds the key. Balance of foodstuffs, with emphasis on high quality foods, would seem to be the preferred approach. Effective nutritional protection of the fetus begins long before conception and must continue throughout the childbearing period. Further investigation of the role of the placenta in the reproductive process seems in order, and better methods and normal standards for the evaluation of newborn infants are needed. A long-range educational program about the value of nutritional protection is needed for the coming generation, in medical schools, and for the public at large. The nutritional approach to the problems of reproduction can be more effectively used, both in practice and in investigation.

References

1. Lilienfeld, A. M., and Pasamanick, B.: Association of Maternal and Fetal Factors with Development of Epilepsy: Abnormalities in Prenatal and Paranatal Periods, J. A. M. A. **155**:719-724 (June 19) 1954.

2. (*a*) Smith, C. A.: Effect of Wartime Starvation in Holland upon Pregnancy and Its Product, Am. J. Obst. & Gynec. **53**:599-608 (April) 1947. (*b*) Nowak, J.: Häufigkeit der Missgeburten in den Nachkriegsjahren 1945-1949, Zentralbl. Gynäk. **72**:1313-1328, 1950. (*c*) Aresin, N., and Sommer, K. H.: Missbildungen und Umweltfaktoren, ibid. **72**:1329-1336, 1950. (*d*) Antonov, A. N.: Children Born During Siege of Leningrad in 1942, J. Pediat. **30**:250-259 (March) 1947.

3. (*a*) Ebbs, J. H.; Tisdall, F. F.; and Scott, W. A.: Influence of Prenatal Diet on Mother and Child, J. Nutrition **22**:515-526 (Nov.) 1941. (*b*) Woodhill, J. M.; Van Den Berg, A. S.; Burke, B. S.; and Stare, F. J.: Nutrition Studies of Pregnant Australian Women, Am. J. Obst. & Gynec. **70**:987-1009 (Nov.) 1955. (*c*) Burke, B. S.: Nutrition During Pregnancy: Review, J. Am. Dietet. A. **20**:735-741 (Dec.) 1944.

4. Hogan, A. G.: Nutrition, Ann. Rev. Biochem. **22**:299-318, 1953.

5. Malpas, P. J.: Incidence of Human Malformations and Significance of Changes in Maternal Environment in Their Causation, J. Obst. & Gynaec. Brit. Emp. **44**:434-454 (June) 1937.

6. (*a*) Whitely, J. R.; O'Dell, B. L.; and Hogan, A. G.: Effect of Diet on Maze Learning in Second Generation Rats: Folic Acid Deficiency, J. Nutrition **45**:153-160 (Sept.) 1951. (*b*) Harrell, R. F.; Woodyard, E. R.; and Gates, A. I.: Influence of Vitamin Supplementation of Diets of Pregnant and Lactating Women on Intelligence of Their Offspring, Metabolism **5**:555-562 (Sept.) 1956.

7. Warkany, J.: Congenital Malformations Induced by Maternal Dietary Deficiency: Experiments and Their Interpretation, Harvey Lect. (1952-1953) **48**:89-109, 1954.

8. Wilson, J. G., and Barch, S.: Fetal Death and Maldevelopment Resulting from Maternal Vitamin A Deficiency in Rat, Proc. Soc. Exper. Biol. & Med. **72**:687-693 (Dec.) 1949.

9. Pfaltz, H., and Severinghaus, E. L.: Effects of Vitamin Deficiencies on Fertility, Course of Pregnancy, and Embryonic Development in Rats, Am. J. Obst. & Gynec. **72**:265-276 (Aug.) 1956.

10. Balfour, M. I.: Supplementary Feeding in Pregnancy, Lancet **1**:208-211 (Feb. 12) 1944. References 3*a* and 6*b*.

11. Ferguson, J. H., and Hinson, M. L.: Importance of Protein in Maternal Diets: and Charity Hospital Survey, J. Louisiana M. Soc. **105**:18-21 (Jan.) 1953.

12. Nesbitt, R. E. L., Jr.: Prolongation of Pregnancy: A Review, Obst. & Gynec. Surv. **10**:311-362 (June) 1955. Clifford, S. H.: Postmaturity—with Placental Dysfunction: Clinical Syndrome and Pathologic Findings, J. Pediat. **44**:1-13 (Jan.) 1954.

13. Flexner, L. B., and others: Permeability of Human Placenta to Sodium in Normal and Abnormal Pregnancies and Supply of Sodium to Human Fetus as Determined with Radioactive Sodium, Am. J. Obst. & Gynec. **55**:469-480 (March) 1948.

14. Hepner, R.: Unpublished data.

15. Friis-Hansen, B.: Changes in Body Water Compartments During Growth, Acta paediat. (supp. 110) **46**:1-68 (Jan.) 1957.

DIAGNOSTIC PROBLEMS

GENERALIZED ABDOMINAL PAIN AND ACUTE RENAL FAILURE

Clinical Pathological Conference (PM 1228-56), Feb. 7, 1957, from the Department of Pathology and the Hektoen Institute for Medical Research of Cook County Hospital, Chicago, presented for publication by Daniel S. Kushner, M.D., and Paul B. Szanto, M.D.

Clinical Data and Discussion

Dr. Edmund F. Foley: A 48-year-old car washer entered Cook County Hospital with the chief complaint of abdominal pain. He had been well until five days prior to admission, when he noted persistent lower abdominal pain aggravated by walking. He was free of pain at rest. Two days later, he awoke with more severe generalized abdominal pain, radiating to the right side of the back, and associated with vomiting. He passed flatus but no stool. He was able to eat and defecate (with catharsis) on the two days before admission, but the pain persisted at the same level of intensity. Systemic review revealed a chronic, productive cough and postnasal drip of five months duration. There was no hemoptysis and no chest pain until the present illness when he began to have substernal and chest pain on the left when coughing. He had had night sweats and some loss of weight since onset of illness. His history included pneumonia in 1953, gonorrhea in 1933, and chronic conjunctivitis and lacrimation in 1941. He had had no previous gastrointestinal complaints.

Physical examination revealed a well-developed, well-nourished, cooperative man. His temperature was 100 F (37.8 C), pulse 90, respirations 28 per minute, and blood pressure 155/95 mm. Hg. There was a profuse conjunctival exudate. The abdomen was tender in all quadrants, especially on the left side. There was 2+ guarding and 1+ rebound tenderness but no distention. No viscera were enlarged, and no masses were palpated. Rectal examination was negative; a stool benzidine test was positive (3+).

It would seem that the patient had an acute abdomen of five days' duration. A diagnostic dilemma was created because, after five days, all the usual symptoms had been disguised by the secondary defense. A person with an acute abdomen, seen so late, generally has peritonitis, and the way in which he arrived at his peritonitis has become obscured. One should first consider acute appendicitis, then diverticulosis, diverticulitis, weeping diverticulum, perforated ulcer, and inflammation of other organs, such as an acute pancreatitis.

Gastric analysis revealed no free acid (no histamine given), and no reaction with benzidine dihydrochloride. Urinalysis showed acid reaction, albumin 4+, and no sugar or bile; microscopy revealed many red blood cells and somewhat fewer leukocytes and hyaline casts. These findings could result from an acute pancreatitis. A roentgenogram of the chest was negative. A roentgenogram of the abdomen revealed gas-distended intestines but no free air. This man was a car washer, raising the possibility of carbon tetrachloride intoxication. He had no pneumonitis or evidence of tuberculosis. There was no radiologic evidence of a closed-loop obstruction but simply a diffuse distention of the intestines with gas, which would be present in any type of ileus, especially from a five-day-old abdominal process.

The most disturbing findings were the initial nonprotein nitrogen level of 162 mg. per 100 ml. and serum amylase level of 256 units (Wolgemuth). (Amylase levels, when determined by a modification of the method of Wolgemuth, normally range to 32 units with blood and to 64 units with urine.) On the following day, the nonprotein nitrogen level was 230 mg. per 100 ml., serum creatinine level 17 mg. per 100 ml., and serum amylase level 8 units. On the fourth hospital day, the nonprotein nitrogen level was 216 mg. per 100 ml. and serum creatinine level 13 mg. per 100 ml. The serum amylase level was 8 units and the carbon dioxide combining power 34 cc. per 100 cc. On the sixth hospital day, the nonprotein nitrogen level was 252 mg. per 100 ml., creatinine level 22.5 mg. per 100 ml., serum sodium level 115 mEq. per liter, chloride level 74 mEq. per liter, potassium level 7.9 mEq. per liter, and carbon dioxide combining power 15 cc. per 100 cc. The hemoglobin level was 64%; erythrocyte count 3,510,000 per cubic millimeter, and leukocyte count 15,200 per cubic millimeter. A blood Kahn test was negative.

At this point we have a man who had a five-day-old surgical abdomen, with profound azotemia. If we look first at the azotemia as a diagnostic wedge, we would consider the traditional prerenal, renal, and postrenal mechanisms. Prerenal azotemia

---

Dr. Kushner is Associate Director of Medical Education, Cook County Hospital, and Instructor in Medicine, Northwestern University Medical School; Dr. Szanto is Director, Department of Pathology, Cook County Hospital, and Professor of Pathology, Chicago Medical School.

Dr. Foley is Head of the Department of Medicine, Cook County Hospital, and Professor of Medicine, University of Illinois College of Medicine.

is essentially the result of a certain dysfunction of the kidney. One must consider that the kidney does a tremendous amount of work. In the course of an hour, a barrel of blood runs through the kidneys, and in 24 hours, a barrel and a half of glomerular filtrate passes through, and from this filtrate, one quart of water is thrown out as urine. Blood flow to the kidney may be compromised by hemorrhage or by loss of water, as the result of dehydration, vomiting, diarrhea, chills, or diabetic coma. Blood may not get to the kidney because there is not enough propulsive power of the heart. Finally, the kidney may not get enough blood due to infection of the peritoneal cavity. Such prerenal azotemia is of itself reversible and it is spoken of as being prerenal when its duration or significance are not sufficiently important to register irreversible damage to the kidney itself. On the other hand, if renal ischemia leads to necrosis, the result is a so-called lower nephron nephrosis, acute nephrosis, or acute renal failure. The mechanism may be simple renal ischemia or a toxic agent which directly attacks the kidney per se, such as carbon tetrachloride or other heavy metals, certain toxins, and certain hypersensitivity states. These, then, are the prerenal situations in which the kidney may fail or its function may be disturbed, resulting in azotemia.

At the renal level, an end-stage-kidney may have been produced by glomerular nephritis, nephrosclerosis, chronic pyelonephritis, or even myeloma or amyloid or bilateral renal cortical necrosis. Postrenal azotemia may be due to obstructive uropathy, especially associated with infection. This occurs commonly in pyelonephritis with stones, though any condition leading to back pressure sufficient to produce hydronephrosis may produce a cystic type of kidney resembling polycystic disease. A relatively common situation is that of the woman with carcinoma of the cervix, invasion of both ureters, and azotemia secondary to hydronephrosis. In men, prostatism with infection may result in urosepsis, a malignant and vicious condition. Our patient went to the World's Fair, contracted gonorrhea, and probably was treated with protargol and sounds, leaving him with strictures; he entered in a state that would make us consider the possibility of an obstructive uropathy.

I think this was a patient with acute renal failure. The heart was not enlarged, there was no significant hypertension, and there was nothing to indicate preexisting renal disease. We are forced to consider that his azotemia was on the basis of acute renal failure, due either to prerenal causes or postrenal causes, perhaps related to hydronephrosis secondary to obstructive uropathy.

Therapy was commenced with constant gastric suction, intravenously given fluids, and electrolytes; 0.5 mg. of atropine and 600,000 units of procaine penicillin were given every 6 hr. On the next day, he was comfortable and free of pain but appeared ill. He coughed frequently—a deep husky, productive cough. He sat up readily when examined.

Physical examination revealed a blood pressure of 124/86 mm. Hg, maximum tenderness in the epigastrium, poorly-localized Murphy's test, and hypoactive intestinal sounds; otherwise the findings were as on admission. His teeth were blood-stained, and he was thought to be coughing up blood. The urethra was obstructed, and no catheter could be passed beyond the prostate.

On the second hospital day, pain returned and the patient continued to have abdominal pain and fever until he died, in spite of oxytetracycline being added to the therapy. A Foley catheter was introduced; the urine was initially clear but soon became bloody. Most of the tenderness was now in the right upper abdominal quadrant. A diagnostic abdominal paracentesis was negative. On the third day, the patient was restless and hallucinated. He was given 50 mg. of chlorpromazine four times a day. There was a uremic frost on the shoulders and upper arms. Total urinary output for the day was 100 cc. of bloody urine. This improved after that and rose to 2,000 cc. on the sixth day, but his condition continued to deteriorate, and he died on the seventh hospital day.

This man had acute renal failure associated initially with anuria, followed by a diuretic phase. The renal failure was predicated either on the basis of a postrenal condition, an obstructive uropathy with superimposed pyelonephritis producing total eventual failure, or a primary intra-abdominal condition leading to the findings of a surgical abdomen, producing a serum amylase level, five days after onset, of 256 units, with diffuse ileus and abdominal tenderness and ascites.

Pancreatitis notoriously produces acute renal failure, but against this is the high potassium level (ordinarily with pancreatitis, the potassium level is low). On the other hand, this is balanced by a renal shut-down, tending to elevate the potassium level. The serum amylase level was 256 units on admission and subsequently lower. This could mean that it had been even higher before admission. The one thing that speaks against the diagnosis of pancreatitis is the insidious and slow onset in contrast to the usual dramatic onset of acute hemorrhagic pancreatitis. We may, however, miss the diagnosis of pancreatitis, if we insist on a dramatic onset. Most patients with pancreatitis do not develop acute renal shut-down so rapidly. On the other hand, this can occur with any intra-abdominal condition.

Traditionally, there has been the feeling that disproportionate elevation of the creatinine over the nonprotein nitrogen level indicates an obstructive uropathy. I do not think this always holds. We have seen patients walking around with a creatinine level of 20 mg. per 100 ml. who have had glomerular nephritis. It would seem that this patient had an acute renal failure secondary to an acute abdominal catastrophe, probably in the nature of an acute pancreatitis and, secondary to that, perhaps a bilateral renal cortical necrosis.

Dr. Hildegard Schorsch: The roentgenograms were taken on the day of admission. The heart was essentially normal. A fine linear fibrotic density which was residual from an old infection was seen. The costophrenic angles were clear. A small nodular density in the left base appeared to be a nipple shadow. The diaphragm was at a normal level and no free air was seen in the chest film. The abdomen showed a moderate amount of gas scattered throughout. I do not think it was abnormally distended. A loop of the small intestine appeared to be distended, and there was a moderate amount of gas in the stomach. There were calcifications in the pelvic vessels. The right kidney could be readily seen and appeared normal. The left kidney could not be seen and was probably obstructed. There was the suggestion of a small amount of free air under the right leaf of the diaphragm.

Dr. Foley: If free air was seen, we would have to assume weeping of a hollow viscus.

Dr. Schorsch: I am not positive about the free air.

Dr. Foley: Was this picture taken before or after the paracentesis?

Dr. Schorsch: It was taken on the day of admission.

Dr. Robert Freeark: We saw the suspicious area that has been referred to but did not think it was conclusive. We chose to presume that the patient did not have free air in the abdominal cavity.

Dr. Donald Atlas: Since this was a case of acute renal failure, it falls into a category of potentially reversible renal disease. There should be more information as to the urinary output from day to day. Were the fluid intake and output measured? What fluids were given? Was there an electrocardiogram? Was consideration given to peritoneal or extraperitoneal dialysis? In patients with acute pancreatitis with renal failure, there is always an element of extreme shock.

Dr. Foley: Yes, and that speaks against this being pancreatitis. The patient was not in shock at any time. I think a certain number of patients with pancreatitis do develop acute renal failure without shock as the result of ischemia of the kidney secondary to infection, necrosis, and reflex irritation of the peritoneum, with contracture of the calyces of the kidney leading eventually to a backflow type of obstruction.

Dr. Atlas: Another entity that should be mentioned is hemorrhagic necrosis of the papillas which occurs in obstructive urosepsis. This man must have had urinary obstruction. The urine was also suggestive of this diagnosis, in that there were many red blood cells with little pus, which, with the rapid downhill course, is the classic picture.

Dr. Foley: I should have mentioned that. I considered an obstructive uropathy with sepsis and fulminating papillary necrosis.

Dr. Samuel J. Hoffman: What about the rebound tenderness in the left lower abdominal quadrant? If this was a true rebound tenderness, it means peritoneal irritation in that particular area. Could he have had a slow leak of some kind in, for instance, a diverticulum?

Dr. Foley: Yes, but in a five-day-old surgical abdomen, it is hard to tell how the irritation got there. By that time he had ileus and peritonitis, and the only way you could tell would be to trace back the history minute-by-minute.

Dr. Hoffman: The peritonitis could have been walled off.

Dr. Foley: Yes, but here was a man who had a relatively mild, acute surgical abdomen and developed this dramatic acute renal failure. This focuses our attention on some severe catastrophic condition like pancreatitis, but we are discouraged in that diagnosis because he did not present himself in shock. On the other hand, we know that patients with peritoneal infection may develop the same thing. I think this has to be construed as obstructive uropathy with infection, especially of the fulminating type. The fact that he had uremia could have elevated the serum amylase level, but if the amylase level had been elevated on the basis of uremia, I would not have anticipated that it would subside.

Dr. Frederick C. Steigmann: He had gross blood in the urine. Doesn't that point to obstructive uropathy as one of the main factors? Could not the acute abdomen have aggravated that?

Dr. Foley: I would agree that he had an obstructive uropathy with pyelonephritis and some necrosis of the renal papillas, and then a pancreatitis or an acute surgical abdomen could have been the terminal event.

Dr. Hoffman: Could an inflammatory mass that involves the ureter produce blood in the urine?

Dr. Foley: Yes, but he was catheterized, and that could produce bleeding.

Dr. John O'Donoghue: We had a patient in the past week with acute peritonitis of several days duration. At operation his abdomen contained pus, but a capable surgeon was not able to locate where that inflammatory reaction came from. In a patient with left-sided tenderness, guarding, and resistance, we cannot exclude appendicitis, because it can drain over the rectosigmoid junction to the gutter of the left side. There was also a suspicion here of free air, and we have to think of a ruptured viscus.

Dr. Freeark: How wise is it to investigate such a patient, other than the lower urinary tract, in the presence of a rapidly rising nonprotein nitrogen level? Would you advise cystoscopy and retrograde studies? Is there any hope that intravenous pyelogram (IVP) would offer any information?

Dr. Foley: The only thing the IVP would tell you would be to do a retrograde study.

Dr. Atlas: An IVP would not show much with the nonprotein nitrogen at this level. Some have recommended that if the cause is not apparent, cystoscopy with cautious probing of one ureter is indicated because sometimes a large calculus may be found which can be dislodged. Although this level of azotemia contraindicates IVP, it is not a contraindication for cautious cystoscopy.

Dr. Freeark: Is there any danger if one is sure of the uropathy?

Dr. Atlas: Yes, there is danger, but it is a calculated risk one must take in a patient who is otherwise certain to die.

Dr. Foley: I cannot be in total agreement with Dr. Atlas. This is an area in which one cannot generalize. One must evaluate the individual case. There are sufficient differences in each case so that the indications are clear or the contraindications are foremost. I do not think we should lay down a blanket rule to have cystoscopy in all uropathies.

Clinical Diagnosis.—The final clinical diagnosis was acute pancreatitis with acute renal failure, complicated by obstructive uropathy with bilateral renal cortical necrosis.

Pathological Data

Dr. Paul B. Szanto: The body was that of a well-developed, well-nourished man. The pleural cavities contained only a few cubic centimeters of serous fluid. The heart was enlarged (500 Gm.) and showed left ventricular hypertrophy. The coronary arteries were grossly normal. Microscopically, the myocardial fibers were thickened, the nuclei bulky, and old foci of myocardial fibrosis were scattered throughout. The smaller coronary arteries showed some thickening of their walls. The lungs were heavy (1,300 Gm.), and edematous. The peritoneal cavity was free of fluid. The gastrointestinal tract was normal.

The pancreas was enlarged (150 Gm.). Around and within the pancreas, there were numerous yellow opaque foci, measuring up to 0.5 cm. On the cut surface, especially in the head of the pancreas, numerous hemorrhagic foci were seen. The pancreatic duct measured 2 mm. in diameter. Microscopically, sections taken from the head of the pancreas revealed destruction of normal architectural pattern by fat necrosis, associated with leukocytic inflammatory reaction and extensive hemorrhages (fig. 1). In the body and tail of the pancreas, the acini were still preserved, though some were distorted due to edema and interlobular exudative inflammatory reaction. The islands of Langerhans were well-preserved. Throughout the pancreas, the interlobular connective tissue was increased, as evidence of a chronic pancreatic fibrosis, on which the recent acute pancreatitis was superimposed.

Before continuing the presentation of the pathological findings, let us inquire about the possible cause of pancreatitis in general.

Obstruction of Pancreatic Duct.—The common channel theory assumes reflux of bile into pancreatic duct due to obstruction of papilla of Vater caused by (1) calculus at papilla of Vater, (2) spasm of sphincter of Oddi, and (3) edema. A gallstone may be located in the pancreatic duct. Spasm of biliary and pancreatic ducts secondary to disease of the gallbladder may be present. Obstruction of the pancreatic duct without disease of the gallbladder may exist as (1) a stone (pancreatic calculus), (2) spasm of sphincter of papilla of Vater, (3) duodenitis with edema of papilla of Vater, (4) chronic inflammation or fibrosis of pancreas, (5) tumor of pancreas, (6) squamous metaplasia of the ducts, or (7) surgical ligature of the duct.

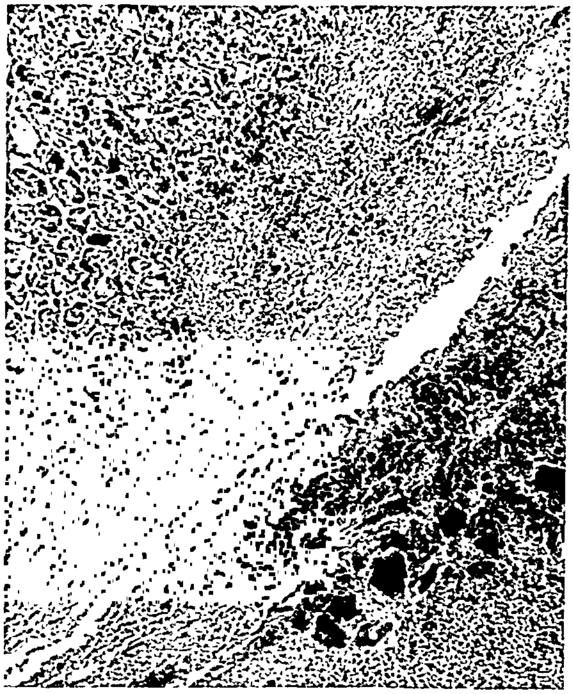


Fig. 1.—Extensive necrosis of pancreas with leukocytic inflammatory reaction.

Metabolic Disturbances.—Diabetes mellitus supposedly favors the development of pancreatitis due to the preexistent arteriosclerotic changes commonly associated with diabetes. In malnutrition the pancreas produces large amounts of protein, therefore, it requires large amounts of amino acids, especially methionine; deficiency in this amino acid, as produced experimentally by administration of ethionine,[1] leads to acute pancreatitis.

Alcohol.—An acute alcoholic bout may be the precipitating factor in pancreatitis due to (1) acute duodenitis, with swelling of the papilla of Vater, (2) increased secretin production leading to an increase in pancreatic juice, or (3) the combination of resistance to excretion due to edematous swelling of the duodenal mucosa and increased production of pancreatic juice, which will result in increased pressure within the pancreatic ducts, leading to rupture of the ducts and necrosis of the pancreatic parenchyma. Chronic alcoholism may lead to protein deficiency (including deficiency in methionine) which may explain the frequency of chronic relapsing pancreatitis in chronic alcoholism.

Trauma.—Accidental or surgical trauma (ligation of pancreatic duct) may result in pancreatitis.

Vascular Changes.—Experimentally, partial or complete obstruction of the pancreatic duct in rats has resulted in edema, inflammation, and atrophy, but no necrosis. When the ducts were occluded after the introduction of bile, no greater damage was observed than that which occurred after simple occlusion, but if temporary or permanent ischemia was produced simultaneously with obstruction to the ducts, necrosis resulted. Similarly, ligation of the pancreatic duct in dogs will lead to edema of the pancreas after administration of secretin. Additional ligation of the superior pancreaticoduodenal artery will result in massive necrosis of the pancreas. On the other hand, a careful review of 100 cases of malignant hypertension revealed not a single instance of diffuse hemorrhagic pancreatitis. Only focal microscopic lesions were seen in such cases.[2]

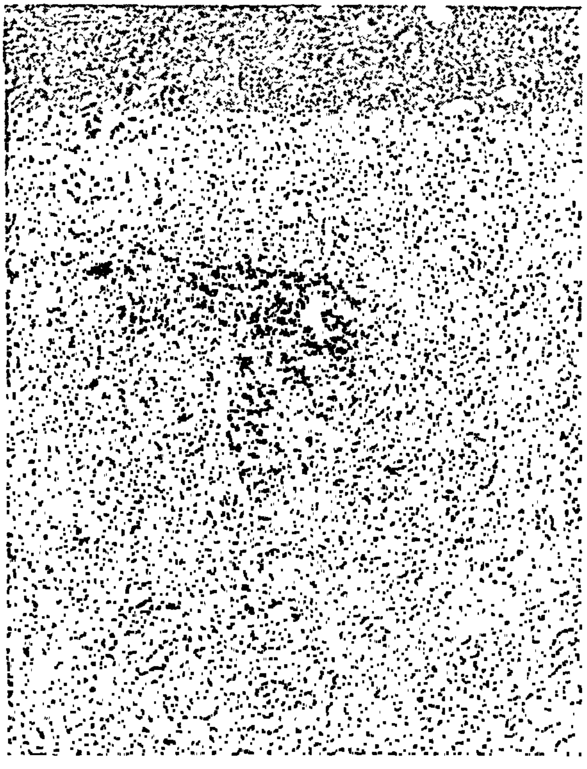


Fig. 2.—Fibrinoid necrosis of small artery with perivascular inflammatory reaction.

Infection.—Various types of infection,[3] e. g., generalized sepsis and virus diseases, such as mumps, may lead to pancreatitis. Direct extension of infection from the gallbladder to the pancreas has been assumed, but there is no direct connection between the lymphatic system of the gallbladder and that of the pancreas.

Allergy.—Injection of endotoxin of meningococci or Echerichia coli into the pancreatic duct, with subsequent intravenous injection of the same toxin, will lead to a massive necrosis.

In this patient, there was no common channel. The pancreatic duct and the common bile duct opened independently. Therefore, we cannot explain this pancreatitis on the basis of the common channel theory. The gallbladder and the bile ducts were normal. The liver was of normal size (1,400 Gm.). It was somewhat pale, and the normal lobular pattern was preserved. The kidneys were enlarged, each weighing 250 Gm. The surface was smooth but of flea-bitten appearance due to hemorrhagic foci, varying in size between 1 and 2 mm. in diameter. Microscopically, some of the glomeruli were hyalinized, but a few appeared smudgy, just as were the vasa efferentes. This smudginess of the arterioles and small arteries can be interpreted as evidence of arteriolar necrosis (necrotizing arteriolitis), superimposed on nephrosclerosis (fig. 2). In addition to these gross changes, the medulla showed numerous gray-white streaks, and, microscopically, extensive infiltration by polymorphonuclear leukocytes. Similarly, streaks of leukocytes were seen in the cortex with beginning formation of abscesses. This ascending pyelonephritis developed secondary to a purulent prostatitis, superimposed on a benign prostatic hypertrophy, which accounts for the clinical findings of urinary obstruction. In addition, to the ascending pyelonephritis, nephrosclerosis, and necrotizing arteriolitis, the distal convoluted tubules, Henle's loops, and excretory ducts contained heme casts, interpreted as evidence of hemoglobinuric nephrosis (lower nephron nephrosis) because of the simultaneous necrosis of these tubules and escape of heme casts from the disintegrating tubules. The necrotizing arteriolitis was not limted to the kidney; the perirenal and periadrenal fat tissue and the spleen presented the same vascular changes. In the pancreas, the arteriolar necrosis was present not only in areas of necrosis but also in those parts of the pancreas that were relatively well-preserved (fig. 3).

Comment

Twelve days before death, this patient developed severe abdominal pain and an elevated serum amylase level on the basis of acute hemorrhagic pancreatitis. He subsequently developed acute nephrosis (lower nephron nephrosis), which is a typical complication of hemorrhagic pancreatitis. Evidences of hypertension included the blood pressure of 155/95 mm. Hg, in the face of a shock-like state, cardiac enlargement with left ventricular hypertrophy, and nephrosclerosis. Finally, a purulent prostatitis led to lower urinary tract obstruction and ascending pyelonephritis.

In relation to the previously outlined multiple theoretical causes of pancreatitis, there are four possibilities to explain this combination of renal and pancreatic findings: First, the combination of hypertension and uremia led to generalized arteriolar necrosis, which in association with urosepsis, led to acute pancreatitis. Among the various theories about the etiology and pathogenesis of acute pancreatitis, the application of Shwartzman-Sanarelli phenomenon is worthy of consideration. Shwartzman induced severe hemorrhagic necrotic reactions in the skin of rabbits by intradermal injection of a cell-free filtrate of Salmonella typhosa, followed by intravenous injection of a small amount of this same filtrate 24 hours later. Applying this principle, it has been found that injection of a bacterial endotoxin in sublethal doses into a pancreatic duct of rabbits, followed by intravenous injection of the same antigen, resulted in fulminating pancreatitis.[4] Subsequent investigations revealed that antigenic specificity is not involved, e. g. the antigens used for sensitization and for provocation of the reaction need not be related.

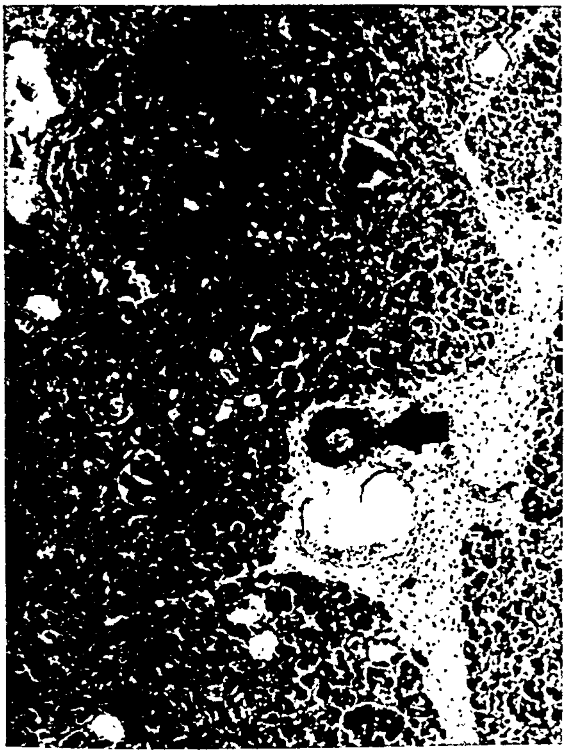


Fig. 3.—Fibrinoid necrosis of small artery in pancreas. Tissue in this area is relatively well preserved.

Later, Shwartzman showed that spontaneous sensitization of an organ may occur, in which case, a single intravenous injection of any antigen may suffice to cause a Shwartzman phenomenon.[5] On the basis of this observation, one could speculate that the necrotizing arteritis may have sensitized the pancreatic tissue and that a septicemia, secondary to the purulent prostatitis and acute pyelonephritis, may have provided the provocation leading to massive pancreatic necrosis. An alternative hypothesis could be that consequent to the pyelonephritis, circulating bacteria may have played the role of a sensitizing antigen, and the nonantigenic substances circulating in increased amounts in the blood in the uremic state may have acted as the provocative agents. It has been shown, after local (skin) sensitization, that such nonantigenic substances as agar or starch may be used for the provocative intravenous injection to produce the Shwartzman phenomenon.[6] If this explanation could be accepted, the necrotizing arteritis and arteriolitis would represent a kind of generalized Shwartzman phenomenon,[7] and the pancreatic necrosis would be a localized Shwartzman phenomenon.

The second possibility is that the patient had nephrosclerosis and then developed necrotizing arteriolitis which led to pancreatitis on a direct vascular basis, whereby the prostatic abscess and pyelonephritis would be only incidental. The third possibility is that the patient developed a pancreatitis in relation to an alcoholic bout and that the arteriolar necrosis was secondary to the liberated pancreatic trypsin. The fourth possibility is that the arteriolonephrosclerosis and necrotizing arteriolitis occurred coincidental with the acute hemorrhagic pancreatitis, with no cause or effect relationship. In our material, each of these entities alone occurs rather frequently, and one would expect a certain incidence of their coexistence.

Pathological Diagnosis.—The final pathological diagnosis was acute hemorrhagic pancreatitis, hemoglobinuric nephrosis, purulent prostatitis; ascending pyelonephritis, cardiac hypertrophy and dilatation, arteriolonephrosclerosis, and necrotizing arteriolitis.

References

1. Farber, E., and Popper, H.: Production of Acute Pancreatitis with Ethionine and Its Prevention by Methionine, Proc. Soc. Exper. Biol. & Med. **74**:838-840 (Aug.) 1950.
2. Block, M. A.; Wakim, K. G.; and Baggenstoss, A. H.: Experimental Studies Concerning Factors in the Pathogenesis of Acute Pancreatitis, Surg. Gynec. & Obst. **99**:83-90 (July) 1954.
3. Richman, A.: Acute Pancreatitis, Am. J. Med. **21**:246-274 (Aug.) 1956.
4. Thal, A., and Brakney, E. L.: Acute Hemorrhagic Pancreatic Necrosis Produced by Local Shwartzman Reaction: Experimental Study on Pancreatitis, J. A. M. A. **155**:569-574 (June 5) 1954.
5. Shwartzman, G.: Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological, and Clinical Significance, New York, Paul B. Hoeber, Inc., 1937.
6. Freund, J., and Hosmer, E. P.: Hemorrhagic Reaction at Site of Injection of Toxin's after Intravenous Injection of Starch in Young and Adult Rabbits, J. Immunol. **29**:279-283 (Oct.) 1935.
7. Apitz, K.: Study of Generalized Shwartzman Phenomenon, J. Immunol. **29**:255-266 (Sept.) 1935.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . AUSTIN SMITH, M.D.
Associate Editor . . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

•

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

RISK OF HEPATITIS REDUCED

ELSEWHERE in this issue (page 1735), in an article written with Drs. Wynn A. Sayman, Ross L. Gauld, and Shirley A. Star, Dr. J. Garrott Allen summarizes his long and careful study of the incidence of hepatitis in the recipients of blood and plasma at the University of Chicago. Both the plasma and whole blood used in this study were to a large extent obtained from the same donor population, and all plasma was pooled and stored for six months at an average temperature of 32 C. No other treatment of the plasma was carried out. Six-month follow-up studies on the occurrence of hepatitis were completed on sufficiently large groups of patients receiving whole blood, blood and plasma, and plasma only to yield conclusions which are considered to be statistically significant. A total of 305 individuals received pooled liquid plasma only. The total number of donors represented in the plasma given to these recipients was 12,345, and the average donor exposure per recipient was 41. Considering the large donor exposure represented by each infusion of pooled plasma, and the relatively high incidence of hepatitis in those receiving whole blood only (2.3%), the complete absence of hepatitis in those receiving plasma alone is truly impressive.

The National Academy of Sciences–National Research Council, with the support of the armed services and the Federal Civil Defense Administration, has held under continuous review since 1951 the accumulating evidence regarding the effectiveness of prolonged storage of plasma in the liquid state in the inactivation of the virus of serum hepatitis. Much of Dr. Allen's more recent work has been carried out under the auspices of the Army Research and Development Command, Office of the Surgeon General, and Dr. Ross Gauld has aided greatly in the statistical evaluation of the results. In addition to Dr. Allen's study, which was carried out on blood drawn into trisodium citrate, supporting data have been obtained on A. C. D. plasma stored for six months through the excellent follow-up studies carried out by Dr. Paul Hoxworth in Cincinnati and through a much larger, but somewhat less carefully controlled, series conducted by the Michigan State Health Department. The temperatures of storage have been slightly lower in these studies than that used by Dr. Allen, but well above average room temperature. No cases of hepatitis attributable to the plasma given were observed.

After the presentation of Dr. Allen's data at a meeting of the National Research Council's Subcommittee on Plasma in June, 1958, the subcommittee issued a statement to the effect that "the data now available [are] sufficiently convincing to warrant the conclusion that the storage of liquid plasma under these conditions [six months at approximately 32 C] can be used to produce a product of minimal infectivity." The members considered this method acceptable also for the salvage of plasma from outdated blood and that it was applicable to plasma drawn into either trisodium citrate or A. C. D. solution.

The most important additional evidence presented by Dr. Allen in this report points to the necessity for storage at temperatures higher than usual room temperature for effective inactivation of the hepatitis viruses. The experience described in which additional plasma, obtained from another blood bank where it had been stored for six months at an average temperature of 22 C, produced hepatitis in 17% of recipients, and the absence of hepatitis in recipients of plasma from that blood bank when the storage temperature was increased to 32 C, were very convincing. This experience helps to explain the apparent failure of so-called room temperature storage to inactivate the virus of serum hepatitis in the human volunteer studies so carefully carried out by Dr. Roderick Murray of the U. S. Public Health Service. In these studies, known infected plasma was stored for six months at 22 C and, although the incidence of hepatitis was greatly reduced after six months as compared with three months of storage, one case did occur in 19 individuals receiving the six-month-stored plasma. The level of 22 C was selected by Dr. Murray as his interpretation of average room temperature. In England, this might be interpreted as 18 C. The conditions described in Dr. Allen's present report therefore emphasize the danger of continuing to call this procedure for virus inactivation "room temperature storage."

Dr. Allen is now trying shorter periods of storage at higher temperatures than 32 C, which might permit a more convenient processing procedure. Future studies of this type may serve to define more clearly the relation of time to temperature in the inactivation of the hepatitis viruses. For the present, the NRC subcommittee considers it wisest to adhere to Dr. Allen's tested conditions of storage at approximately 32 C for six months.

One other major recommendation made by the NRC subcommittee is that, for general application of this method, the strictest possible care be given to proper bacteriological control and that, for safety in regard to bacterial contamination, either Seitz filtration or ultraviolet irradiation be added to the processing technique. Not all laboratories can expect to be as fortunate as Dr. Allen's in avoiding bacterial contamination, and even Dr. Allen has reported that 4% of all his plasma pools were found to be contaminated. The danger of bacterial growth in liquid plasma, not always producing effects visible to the eye, is well known, and led to use of the term "liquid dynamite" for such plasma during World War II when it was subjected to careful study by the Navy. However, with the addition of Seitz filtration and/or ultraviolet irradiation and with careful bacteriological control, this hazard can be reduced to a minimum. The problems involved in providing such control will in general make it more practical and economical for individual blood banks to send their plasma for treatment to central processing laboratories having the necessary specialized skills and equipment.

Six months of storage at approximately 32 C is one answer to the problem of providing a safe plasma preparation, but the NRC subcommittee calls attention to other possibilities now under careful evaluation. One method, the partial alcohol fractionation of plasma to remove fibrinogen and most of the globulin fractions, followed by heating for 10 hours at 60 C, has been licensed by the National Institutes of Health Division of Biologics Standards and offers a convenient and practical processing method for commercial application. Chemical sterilization also holds great promise, but this will require more extensive evaluation.

Meanwhile, Dr. Allen's procedure, when combined with adequate measures to achieve bacteriological sterility, remains the simplest and most practical available for the preparation of a safe plasma product and the salvage of plasma from outdated blood.

MISCONCEPTIONS ABOUT EYEGLASSES

At a Cornell Conference on Therapy[1] last fall ideas about many facets of ocular hygiene and the wearing of eyeglasses were aired. Dr. John McLean presented the conference with ammunition with which the general practitioner may combat false popular ideas. For example refractive errors have from time to time been held responsible for many symptoms including nausea, and the characteristic attacks of migraine. In all such cases another cause should be sought because uncorrected refractive errors can cause only lack of visual acuity, fatigue of the muscles of accommodation, and headache. This fatigue, like fatigue in any other muscle, disappears with rest and is not cumulative. Some patients with other symptoms are relieved when corrective glasses are worn, but in such cases the symptoms were psychosomatic and the relief is likely to be temporary. Dr. McLean said that relatively few headaches were of ocular origin, but many if not most ophthalmologists would disagree with this statement. A well-known consultant in this field believes that if a person attempts to do close work with glasses that do not cause obvious blurring but do not correct his refractive error a headache is very likely to develop. Failure to provide correction does not cause myopia to become progressively worse. This usually occurs throughout the growth period and the rate of progression is not influenced one way or another by the wearing of glasses. Presbyopia likewise progresses at its own rate regardless of corrective measures.

Many parents worry that eyestrain may be brought about by too much homework—a worry that schoolboys are often careful to foster. The same schoolboy may pore for hours on end over comic books or some other hobby involving near vision. The ocular fatigue of many a schoolboy can be more correctly attributed to boredom. From time to time patients with refractive errors come under the spell of a faddist who recommends that one throw away one's glasses and "strengthen" the eyes by means of exercises. The limited success of such faddists depends on their ability to teach persons to use their defective vision more effectively.

Children with severe uncorrected visual defects are severely handicapped. They tend to avoid playing with others and may be considered mentally retarded or queer. If glasses are prescribed for such children in time, not only their vision but also their social adjustment is improved. These and other points discussed made the conference one that we are fortunate to have preserved in type.

---

[1] Eyeglasses as Therapeutic Agent, New York J. Med. 57:3167-3173 (Oct. 1) 1957.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

A significant amount of work has been carried out by our Association—its committees of the House of Delegates and the Board of Trustees, the headquarters office, and individual staff members—in the last six months.

Too often, in my opinion, A. M. A. members are not aware of the accomplishments and current projects of their Association. For this reason I want to present briefly some of the highlights of the A. M. A.'s activities in the second half of 1958.

Two important reports will come before the House of Delegates for appropriate consideration and action next week in Minneapolis. One will be the study of the Commission on Medical Care Plans, covering three broad areas—the nature and method of various types of plans through which persons receive the services of physicians, the effect of these plans on quality and quantity of medical care, and the legal and ethical status of arrangements used by various plans. The second report will include the findings and recommendations of the Committee to Study A. M. A. Objectives and Basic Programs.

Two campaigns also have been launched this fall. One is the educational campaign on "the right of the patient to select his own physician." The other is the national drive against food faddism in cooperation with the Food and Drug Administration and the National Better Business Bureau.

I believe that our Association's more than 173,000 members can be extremely proud of our new fortnightly publication, *The AMA News*. With a press run of almost 250,000 *The News* now reaches more physicians than any other A. M. A. publication.

Other A. M. A. publications also have undergone expansion and change. THE JOURNAL, for example, has expanded its popular "Medicine at Work" section and has made it a regular feature. *Today's Health*, the Association's health magazine for the American family, has restyled its format and broadened its editorial approach with the result that circulation and advertising have increased. In addition, the 20th edition of the American Medical Directory was issued last month.

During the fall the Association held two special conferences, a planning session for medical society action in the field of aging and a symposium on adrenal steroids. The former was the kickoff to the profession's positive program for the aged.

Four other regular, but vital, conferences were conducted on foods and nutrition, mental health, civil defense, and public relations.

Special conferences also were held to discuss (1) the Association's proposed model law for labeling dangerous household and chemical products and (2) the Bill of Rights for the College Athlete, an A. M. A. effort to promote safer intercollegiate sports. In addition, the American Bar Association in August adopted the National Interprofessional Code (physicians and attorneys) approved last June by the House of Delegates.

Finally, and perhaps most significant of all, the Executive Vice-President, Dr. F. J. L. Blasingame, recently has reorganized the A. M. A. headquarters staff into six divisions (Council Administration, Scientific Publications, Business, Law, Communications, and Field Service) to promote efficiency, wider service to physicians and the public, and a smoother administrative operation.

Naturally, it is impossible to cover everything that's new in our Association in this brief mid-term report of my stewardship. But the items I have highlighted should prove conclusively that the A. M. A. is an enlightened, dynamic organization.

GUNNAR GUNDERSEN, M.D.
La Crosse, Wis.

MEDICAL NEWS

COLORADO

Woman Physician Honored.—Colorado will be represented for the first time in National Statuary Hall, Washington, D. C., and the statue will be that of the late Dr. Florence Rena Sabin. Congress paved the way for placement of the statue in the Capitol during the closing hours of the recent second session. Under a law that goes back to 1864, each state is allowed two statues of deceased, distinguished citizens. Dr. Sabin, who was noted for her research in the lymphatic system and tuberculosis, died in 1953. She will become the sixth physician honored in Statuary Hall. Others are Dr. Marcus Whitman, who died in 1857, Washington; Dr. John McCoughlin, 1857, Oregon; Dr. John Gorrie, 1855, Florida; Dr. Crawford W. Long, 1878, Georgia; and Dr. Ephriam McDowell, 1830, Kentucky.

ILLINOIS

New State Hospital Superintendents.—Dr. Thomas T. Tourlentes was made superintendent of the Galesburg State Research Hospital effective Sept. 1. Dr. Tourlentes previously was for four years assistant superintendent of the hospital. He is a diplomate of the American Board of Psychiatry and Neurology and clinical assistant professor of psychiatry at Northwestern University Medical School, Chicago. ——Dr. Verdamae Karr McKee became superintendent of the Dixon State School Aug. 1. Previously she was assistant superintendent of the East Moline State Hospital. Dr. McKee is the first woman in the history of the State of Illinois to head a major medical institution.——Dr. J. Herbert Maltz was appointed superintendent of the Chicago State Hospital effective July 16. Dr. Maltz, a native of New Jersey, is a diplomate of the American Board of Psychiatry and had served as assistant superintendent of the hospital previous to his appointment as superintendent.

Chicago

Hospital Grant.—A John A. Hartford Foundation, Inc., grant of $114,000 to the Passavant Memorial Hospital for metabolic studies in renal failure and edema and for research and clinical application of the artificial kidney has been announced. Mr. John N. Hatfield, director of the hospital, said that it will be used over a three-year period and to make possible the activation of the research, teaching, and patient care program which had been planned for the metabolic-artificial kidney unit in the new East Pavilion that will be in operation by late fall. The program will be under the direction of Dr. Arthur R. Colwell, Sr., chairman, department of medicine, Northwestern University Medical School. Dr. David P. Earle, professor of medicine, will coordinate the program as principal investigator with Dr. Francesco del Greco in immediate charge.

Surgeons Present Lecture Series.—The third series of lectures of the International College of Surgeons' Hall of Fame and School of the History of Surgery and Related Sciences held at the Hall of Fame, 1524 Lake Shore Drive, Chicago, began Oct. 21 when Ilza Veith, Ph.D., associate professor in the history of medicine, University of Chicago, the School of Medicine, presented "Changing Concepts of Disease." On Nov. 11, Dr. Morris Fishbein, professor emeritus of medicine, University of Chicago and University of Illinois College of Medicine, presented "Epochs in the History of Medicine." Subsequent lectures are planned as follows:

Dec. 2—The History of Hospitals, Dr. Charles U. Letourneau, director, program in hospital administration, Northwestern University Medical School.
Jan. 13—The History of Gynecology, Dr. Abraham F. Lash, clinical professor of obstetrics and gynecology, University of Illinois College of Medicine.
Feb. 3—The History of Neurosurgery, Dr. Percival Bailey, professor of neurology and neurological surgery, University of Illinois College of Medicine.
Feb. 24—Notes About the Role of Physicians in Our Military History, Dr. George F. Lull, Assistant to the President, American Medical Association.
March 24—Evolution of Medical Illustration, Thomas S. Jones, M.S., emeritus professor of medical and dental illustrations, University of Illinois College of Medicine.
April 14—The History of Surgery of Bones and Joints, Dr. Edward L. Compere, chairman, department of orthopaedic surgery, Northwestern University Medical School and Chicago Wesley Memorial Hospital.
May 5—Development of Otorhinolaryngology and Bronchoesophagology, Dr. Francis L. Lederer, head, department of otolaryngology, University of Illinois College of Medicine.
May 21—The History of Plastic Surgery, Dr. Wayne B. Slaughter, clinical professor in charge of plastic surgery, University of Wisconsin Medical School, Madison, and Stritch School of Medicine of Loyola University.

LOUISIANA

Dr. Ochsner Honored.—Dr. Alton Ochsner, professor of surgery, Tulane University School of Medicine, New Orleans, and director of surgery, Ochsner

---

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

Clinic and Ochsner Foundation Hospital in New Orleans, has received the 1958 "Honor award" given by the Mississippi Valley Medical Society. The honor award is given from time to time to nonmembers of the society "who have made distinguished contributions to clinical medicine." The citation given in connection with the award reads in part: "Your contributions to the medical literature have not been confined to your several books, numerous chapters and more than 390 articles, for you have served as editor of several national medical periodicals and on the editorial board of a number of others. For these many impressive achievements you have been entrusted with the highest office in virtually every national surgical organization and some international ones."

MASSACHUSETTS

Dr. Coons Receives Research Award.—For the seventh Kimble Methodolgy Research Award sponsored by Kimble Glass Division, subsidiary of Owens-Illinois Glass Company, Toledo, Ohio, the award committee of Dr. Frank C. Lawler, chairman, Morris Scherago, D.V.M., and Henry Bauer, Ph.D., have chosen Dr. Albert H. Coons, Boston, to be the recipient. The work for which Dr. Coons was honored on Oct. 26 is "The Development of Fluorescent Antibody Techniques." From 1939 to the present Dr. Coons has held appointments at Harvard University, except from September, 1939-September, 1940, when he was assistant resident in medicine, Thorndike Memorial Laboratory, Boston City Hospital, and from April, 1942, to November, 1945, he was in the Medical Corps of the U. S. Army. At Harvard Medical School he has served as research fellow, instructor, associate, and assistant professor. Since 1953 he has been visiting professor of bacteriology and immunology at Harvard as well as a career investigator, American Heart Association.

MICHIGAN

Appoint Chairman of Department of Internal Medicine.—Appointment of Dr. William D. Robinson, a member of the University of Michigan Medical School faculty since 1944, as chairman of the department of internal medicine, effective Oct. 1, has been announced. He succeeds Dr. Cyrus C. Sturgis, who resigned as chairman in February, 1957, to devote full time to the practice of medicine. Dr. Paul S. Barker has served as acting chairman during the intervening period. Dr. Robinson served with the International Health Division of the Rockefeller Foundation for four years.

MINNESOTA

Judd-Plummer Lecture.—Dr. Thomas M. Durant, head, department of medicine, Temple University School of Medicine, Philadelphia, gave the annual Judd-Plummer Memorial Lecture Oct. 3 during the 34th annual meeting of the Alumni Association of the Mayo Foundation. Dr. Durant spoke on "Medical Education: Responsibilities and Potentialities." The Judd-Plummer Memorial Lecture was established in 1938 by the alumni association to honor the memory of Dr. Edward S. Judd, Mayo Clinic surgeon who died in 1935, and Dr. Henry S. Plummer, specialist in internal medicine of the Mayo Clinic, who died in 1936. The first lecture was given in 1941. Dr. Durant is a member of the editorial board of the *American Heart Journal*, and associate editor of the *American Journal of the Medical Sciences.*

NEW YORK

University Dedicates Nucleus of Medical Center.—The reconstructed Basic Sciences Building of the State University Upstate Medical Center in Syracuse was dedicated formally Oct. 21, with Gov. W. Averell Harriman the principal speaker. Three new wings and a fourth floor have been added. The new building has been reconstructed from a structure completed in 1937, when the medical college was a part of Syracuse University. Now it is a unit of State University of New York. Designed for four classes of 100 medical students each, the Basic Sciences Building contains complete medical science instructional facilities and ample quarters for faculty and student research projects. The six basic science departments located in the building are those of anatomy, microbiology, pathology, physiology, pharmacology, and biochemistry. The Basic Sciences Building is the nucleus of the Upstate Medical Center, which eventually will include colleges of nursing, dentistry, medical technology, and other health fields. The next step in the university's plan for the Medical Center is a new teaching hospital, for which plans are now being drawn. During the week of dedicatory events, members of the Onondaga County Medical Society toured the new building and held a meeting there Tuesday evening. On Oct. 22 the annual Hilda Freeman Silverman lecture was presented in the auditorium by Dr. Alexander D. Langmuir, chief of the U. S. Public Health Service Communicable Disease Center, Atlanta, Ga. The year ending in June, 1959, has been named Dedication Year at the Upstate Medical Center in honor of completion of the new Basic Sciences Building, and a number of special scientific programs and other events are being held.

New York City

Dr. Salisbury Honored.—On the retirement as medical director for many years of the United Fruit Company, Dr. Edward I. Salisbury was guest of honor at a luncheon in New York City, Oct. 17, presented by Dr. Charles M. Gratz, of Greenwich, Conn. The principal speaker at the luncheon was the Honorable Spruille Braden, former American

Ambassador to Cuba and Guatemala, and among the guests were Drs. Richardo Aguilar and Ruben Aguilar, father and son of Guatemala, whose family has been active through four generations in surgery in Central America.

Dr. Scheie to Give Schoenberg Lecture.—The annual Schoenberg Memorial Lecture sponsored jointly by the New York Society for Clinical Ophthalmology and the National Society for the Prevention of Blindness will be given at 8:15 p. m., Dec. 1, at the New York Academy of Medicine, 2 E. 103rd St. Dr. Harold G. Scheie, professor of ophthalmology, University of Pennsylvania School of Medicine, Philadelphia, will give an address on "Management of Infantile Glaucoma." Dr. Mark J. Schoenberg, a New York ophthalmologist, was prominent in the work of both the National Society for the Prevention of Blindness and the New York Society for Clinical Ophthalmology. Since his death in 1945, the two societies have joined each year in honoring his memory. All physicians will be welcome.

Personal.—Dr. Hector Mazzella has been appointed visiting professor of physiology at the State University of New York Downstate Medical Center in Brooklyn. Dr. Mazzella is a professor of physiology at the School of Medicine in Montevideo, Uruguay, and is the author of many articles in scientific subjects.——At a special ceremony Sept. 19 Dr. Ben-Henry Rose was decorated by the Haitian Government with the medallion and certificate of the appointment as an Officer in the National Order of Merit and Honor of the Republic of Haiti "for meritorious professional services rendered to Haitians upon his several visits to that country, and to their compatriots residing in New York."——Dr. James B. Amberson, III, professor of medicine emeritus at Columbia University's College of Physicians and Surgeons and former visiting physician in charge of Bellevue Hospital's chest service, has been named general director of the New York Tuberculosis and Health Association, where he previously held the title of director. At the same time Mr. Irving Mushlin, associate director since 1955, was named managing director of the association.

PENNSYLVANIA

Philadelphia

Stieglitz Memorial Lecture.—The first Edward Julius Stieglitz Memorial Lecture was given recently at a banquet in connection with Lankenau Hospital's two-day research conference on "Bone As A Tissue." Clive M. McCay, Ph.D., professor of nutrition at Cornell University Medical College, New York, since 1934, presented the memorial address on "Nutritional Influences on Bone." The lectureship was established to commemorate Dr. Stieglitz, who died last summer. A pioneer in geriatrics, Dr. Stieglitz authored the "Care of the Aging and the Aged" and "Medical Care of Later Maturity."

Shop for Surgical Needs.—At the Cardiovascular Institute, Hahnemann Medical College and Hospital, a plaque has been placed honoring the members of the Philadelphia Chapter, Machinery Dealers National Association, who donated machine tools and money to the Mary Bailey Foundation for a specialized shop. The metal-working machine shop, located in the Cardiovascular Institute, will be used by doctors and technicians to produce new, experimental surgical instruments, tools, and equipment needed in the advance study of heart surgery. The effort began two years ago when officials of the foundation asked the Philadelphia Chapter of MDNA for assistance in planning and equipping such a shop, which would eventually reduce the cost of such instruments and equipment.

TENNESSEE

Symposiums on Nutrition and Medical Education.—On Dec. 4 and 5 the Vanderbilt University School of Medicine, Nashville, will present two symposiums in honor of John Barlow Youmans on "Nutrition in Internal Medicine," with Dr. Frank B. Berry, assistant secretary of defense (health and medical), Washington, D. C., as chairman, and "Medical Education," with Dr. Joseph C. Hinsey, director, New York Hospital–Cornell Medical Center, New York City, as chairman. A subscription dinner is planned for 7 p. m., Dec. 4. A panel discussion, "Medical Education—Its Future," will be moderated by Dr. Robert C. Berson and will include the following participants: Dr. Lowell T. Coggeshall, dean, Division of the Biological Sciences including the School of Medicine, University of Chicago; Dr. Lester J. Evans, executive associate, The Commonwealth Fund, New York City; Dr. C. Sidney Burwell, Samuel A. Levine professor of medicine, Harvard University, Boston; and Dr. Ward Darley, executive director, Association of American Medical Colleges, Evanston, Ill. For information write the Symposia Secretary, School of Medicine, Vanderbilt University, Nashville 5, Tenn.

WISCONSIN

Cancer Seminar in Milwaukee.—The annual cancer seminar sponsored by the Wisconsin Society of Pathologists and Milwaukee Chapter of the American Cancer Society will be presented Dec. 6, 1 p.m., at Marquette University School of Medicine, Milwaukee. The seminar will be on "Tumors of the Chest," moderated by Dr. William A. D. Anderson, of Miami, Fla. There will be a morning session devoted to clinical pathology presented by the membership. A limited supply of slide sets are available at $10 service charge. Requests should be directed to: Dr. Robert S. Haukohl, 561 N. 15th St., Milwaukee 3, Wis.

GENERAL

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Nov. 1, 1958		Nov. 2, 1957
	Paralytic Type	Total Cases	Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	1	1	..
Massachusetts	1	1	..
Rhode Island	..	..	..
Connecticut	1	1	..
Middle Atlantic States			
New York	5	11	6
New Jersey	2	5	2
Pennsylvania	..	..	1
East North Central States			
Ohio	2	13	9
Indiana	6	9	12
Illinois	6	12	4
Michigan	20	40	8
Wisconsin	1	1	2
West North Central States			
Minnesota	..	..	..
Iowa	1	2	..
Missouri	6	6	1
North Dakota	..	..	..
South Dakota	..	..	1
Nebraska	..	1	1
Kansas	..	..	..
South Atlantic States			
Delaware	..	..	..
Maryland	1	1	2
District of Columbia	..	..	..
Virginia	6	7	2
West Virginia	..	..	1
North Carolina	..	2	..
South Carolina	..	..	1
Georgia	1	1	2
Florida	2	11	1
East South Central States			
Kentucky	10	11	1
Tennessee	1	1	..
Alabama	..	..	..
Mississippi	1	1	..
West South Central States			
Arkansas	..	..	..
Louisiana	1	1	..
Oklahoma	..	..	..
Texas	18	21	9
Mountain States			
Montana	..	..	..
Idaho	..	1	..
Wyoming	..	4	..
Colorado	..	..	1
New Mexico	6	7	..
Arizona	2	2	1
Utah	..	..	..
Nevada	..	..	..
Pacific States			
Washington	..	..	2
Oregon	..	..	1
California	10	11	11
Territories and Possessions			
Alaska	..	..	..
Hawaii	2	2	..
Puerto Rico	..	..	..
Total	113	187	77

Bahamas Surgical Conference.—The first Bahamas Surgical Conference will be held at the British Colonial Hotel, Nassau, Dec. 29-Jan. 17. Among the speakers will be:

Drs. Lowell F. Bushnell, Los Angeles; Robert E. Cassidy, James H. Ferguson, Francis N. Cooke, John J. Farrell, Donald W. Smith, Miami; Max G. Carter, New Haven; John M. Chamberlain, Gerald H. Pratt, Charles E. Rogers, New York; Lawrence S. Fallis, James Barron, Jean P. Pratt, Detroit; Lewis K. Ferguson, Arthur Finkelstein, Henry J. Tumen, Robert P. Glover, Louis E. Silcox, Philadelphia; Randolph L. Clark Jr., Edgar C. White, William O. Russell, Houston; Raymond H. Rigdon, Galveston; Philipp R. Rezek, Miami; Bella R. Hearst, Dallas; William A. Hopkins, Atlanta; Maurice S. Mazel, Chicago;; Karl P. Klassen, Columbus, Ohio; George G. McHardy, New Orleans.

The Sunday Evening Lecture will be given by Mr. M. E. Lerch, eastern director of public relations, Household Finance Corporation. Six movie films will be available for showing. Participants in the conference and their parties enjoy special reduced hotel rates at the British Colonial Hotel in Nassau, provided that reservations are made by writing directly to "Bahamas Conference," P. O. Box 4037, Fort Lauderdale, Fla. Reservations should be made at once. If reservations are made by telephone, call JAckson 3-7303 at Fort Lauderdale, Fla. Indicate the type of accommodation required.

Midwest Allergists Meet in Detroit.—The Sheraton Cadillac Hotel, Detroit, will be headquarters for the Midwest Forum on Allergy, Dec. 6-7, sponsored by the Michigan Allergy Society and including the allergy societies of Buffalo, Chicago, Cleveland, Michigan, Ohio Valley, Pittsburgh, and West Virginia. Dr. Sara Dubo, Northville, Mich., will present "Psychiatry and Allergy" as guest lecturer the morning of Dec. 6. The following panel discussions and participants are planned:

Drug Allergy, Drs. Edward A. Carr Jr., Ann Arbor, Mich.; Max Samter, Chicago; and Theodore L. Squier, Milwaukee.
Insect Allergy, Drs. Frank Perlman, Portland, Ore.; Karl D. Figley, Toledo, Ohio; Iredell M. Hinnant, Cleveland; and Howard Osgood, Buffalo, N. Y.
Occupation and Allergy, Drs. Seward E. Miller, Ann Arbor, Mich.; William R. Buckley, Rochester, N. Y.; Rex H. Wilson, Akron, Ohio; and Harold H. Gay, Midland, Mich.

A symposium the afternoon of Dec. 6 on "Corticotropin and Corticosteroids" will be moderated by Dr. Carl E. Arbesman, Buffalo, N. Y. Following dinner that evening Warren H. Wagner Jr., Ph.D., Ann Arbor, Mich., will present "Ragweed Pollen: Its Production, Emanation, Dissipation and Destruction." For information write Dr. John M. Sheldon, University Hospitals, Ann Arbor, Mich., General Chairman.

Chest Physicians Meet in Minnesota.—The Interim Session of the American College of Chest Physicians will be held on Nov. 29-30 at the Mayo Clinic and Kahler Hotel, Rochester, Minn., and on Dec. 1 at the Radisson Hotel, Minneapolis. The morning session Nov. 29 will consider thoracic and cardiovascular surgery followed by a motion picture session including seven films. That afternoon a pulmonary section and cardiac section will be held, and the banquet, presided over by Dr. Donald R. McKay, Buffalo, New York, president of the college, will be held that evening. Four round-table luncheons will be presented Nov. 30:

Disorders of Esophageal Motility, moderated by Dr. Charles F. Code, Rochester, Minn.
Bronchography, Indications and Techniques, Dr. Sheldon E. Domm, Knoxville, Tenn.
Surgical Treatment of Acquired Valvular Heart Disease, Dr. Robert P. Glover, Philadelphia.
Early Detection of Emphysema, Dr. Peter A. Theodos, Philadelphia.

Nine fireside conferences will be presented the evening of Nov. 30. A panel discussion, "Inhalation Therapy," moderated by Dr. Edwin R. Levine, Chicago, is planned for the evening of Dec. 1. For information write the American College of Chest Physicians, 112 E. Chestnut St., Chicago 11.

Missing Person Wanted.—The Salt Lake County (Utah) Sheriff's Office is seeking information on the whereabouts of Richard Nunley, aged 26, who has a light complexion, blue eyes, blond straight hair, is 5 ft. 10 in. in height, and weighs 160 lbs. On Sept. 3, Nunley and his 3-year-old son, Raymond Scott Nunley, left their home for a grocery store two blocks away. When they failed to return a few days later, the Salt Lake County Sheriff's Office was notified and a missing person broadcast was made. Later the Sheriff's Office was notified that Richard Nunley was seen in Montpelier, Idaho. This was the last information received on these people until late afternoon on Oct. 7, when the decomposed body of Raymond Nunley was found in a field two blocks from the store.

Richard Nunley.

Nunley was last seen wearing charcoal slacks, and a light shirt with pink dots. He has worked at theatres as an operator and handy man and may seek this type of employment.

His fingerprint classification is as follows:

26	L	25	W	MOM	21
	L	4	W	IOI	

If anyone knows Richard Nunley's whereabouts, they are requested to contact the Salt Lake County Sheriff, George Beckstead, City and County Building, Salt Lake City, Utah, or their local law enforcement office.

LATIN AMERICA

Zoonoses Center in Argentina.—The Rockefeller Foundation has made available some $10,000 to further the fight against the zoonoses in the Americas. The Pan American Zoonoses Center, established in 1956 in Azul, Argentina, 185 miles south of Buenos Aires, is the only institution of its kind. At present its work is concentrated on rabies, brucellosis, and hydatidosis. Work in the virus encephalitides, anthrax, leptospirosis, bovine tuberculosis, psittacosis, trichinosis, and salmonellosis will be increased as the facilities permit. The center offers many services: training, consultation, field demonstrations, confirmatory diagnostic tests, and research, under the administration of the Pan American Sanitary Bureau.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least six weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications is Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Written.* Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.
ALASKA:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.
ARIZONA:* *Written Examination and Reciprocity.* Phoenix, Jan. 14-16. Sec., Dr. Thomas H. Bate, 2910 North 7th Ave., Phoenix.

California: *Oral Examination*, San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates*. San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

Colorado: *Written*. Denver, Dec. 9-10. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

Connecticut:* *Homeopathic. Examination*. Derby, Jan. 13. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

Delaware: *Written Examination and Endorsement*. Dover, Jan. 13-15, Jan. 22. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

Florida:* *Examination*. Miami Beach, Nov. 23-25. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami 36.

Georgia: *Examination and Reciprocity*. Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

Guam: *Subject to Call*. Act. Sec., Dr. F. L. Conklin, Agana.

Idaho: *Examination and Endorsement*. Boise, Jan. 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

Illinois: *Examination and Reciprocity*. Chicago, Jan. 26-30. Supt. of Registration, Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

Iowa:* *Examination and Endorsement*. Des Moines, Dec. 8-10. Exec. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines 19.

Kentucky: *Examination*. Louisville, Dec. 8-10. Sec., Dr. Russell E. Teague, 620 South Third St., Louisville 2.

Louisiana: *Examination and Reciprocity*. New Orleans, Dec. 11-13. Sec., Dr. Edwin H. Lawson, 930 Hibernia Bank Bldg., New Orleans 12.

Maryland: *Examination*. Baltimore, Dec. 9-11. Sec., Dr. Frank K. Morris, 1211 Cathedral St., Baltimore 1.

Massachusetts: *Examination*. Boston, Jan. 13-16. Sec., Dr. Robert C. Cochrane, State House, Room 37, Boston 33.

Montana: *Examination and Reciprocity*. Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

Nebraska:* *Examination*. Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

Nevada:* *Examination and Reciprocity*. Reno, Dec. 2. Sec., Dr. George H. Ross, 112 North Curry St., Carson City.

New Hampshire: *Examination and Endorsement*. Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

New York: *Examination*. Albany, Buffalo, New York and Syracuse, Dec. 2-5. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

North Carolina: *Reciprocity*. Southern Pines, Jan. 17. *Examination*. June. Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

North Dakota: *Examination and Reciprocity*. Grand Forks, Jan. 7-10. Sec., Dr. C. J. Glaspel, Grafton.

Ohio: *Examination*. Columbus, Dec. 16-18. *Endorsement*. Columbus, Dec. 16-18. Sec., Dr. H. M. Platter, Wyandotte Bldg., Columbus 15.

Oklahoma:* *Examination*. Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

Oregon:* *Examination*. Portland, Jan. 6-7. *Reciprocity*. Portland, Jan. 8-10. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

Pennsylvania: *Endorsement*. Harrisburg, Dec. 11-12. *Examination*. Philadelphia, Jan. 7-10. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

Rhode Island:* *Examination*. Providence, Jan. 8-9. Admin., Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

South Carolina: *Endorsement*. Columbia, Dec. 9. Sec., Dr. H. E. Jervey, Jr., Blanding Bldg., Columbia.

South Dakota:* *Examination*. Sioux Falls, Jan. 20-21. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

Tennessee:* *Examination*. Memphis, Dec. 17-18. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis 3.

Texas:* *Examination and Reciprocity*. Fort Worth, Dec. 4-6. Sec., Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth 2.

Utah: *Examination*. Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

Virginia: *Examination and Reciprocity*. Richmond, Dec. 4-6. Address: Virginia Board of Medical Examiners, 631 First St., S. W., Roanoke.

Washington:* *Examination*. Seattle, Jan. 12-14. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

West Virginia: *Examination and Reciprocity*. Charleston, Jan. 5-7. Sec., Dr. Newman H. Dyer, State Office Bldg. No. 3, Charleston 5.

Wisconsin:* *Examination and Reciprocity*. Madison, Jan. 13-15. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., 1 West Wilson St., Madison.

Wyoming: *Examination and Reciprocity*. Cheyenne, Feb. 2. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Arizona: *Examination*. Tucson, Dec. 16. Sec., Mr. Herman E. Bateman, University of Arizona, Tucson.

Colorado: *Examination and Reciprocity*. Denver, Dec. 3-4. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

Connecticut: *Examination*. New Haven, Feb. 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

Florida: *Examination*. Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

Iowa: *Examination*. Des Moines, Jan. 13. Sec., Dr. Elmer W. Hertel, Wartburg College, Waverly.

Kansas: *Endorsement*. Kansas City, Jan. 14. *Examination*. Kansas City, Jan. 16-17. Sec., State Board of Healing Arts, Dr. F. J. Nash, New Brotherhood Bldg., Kansas City.

Michigan: *Examination*. Ann Arbor and Detroit, Feb. 12-13. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., West Michigan Ave., Lansing.

Minnesota: *Examination*. Minneapolis, Jan. 6-7. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

Nevada: *Examination and Reciprocity*. Reno, Dec. 2. Sec., Dr. Donald G. Cooney, Box 9005, University of Nevada, Reno.

New Mexico: *Examination*. Santa Fe, Jan. 18. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

Oklahoma: *Examination*. Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

Oregon: *Examination*. Portland, Dec. 6. Sec., Dr. Earl M. Pallett, Box 5175, Eugene.

Rhode Island: *Examination*. Providence, Nov. 19. Admin. of Professional Regulation, 366 State Office Bldg., Providence.

South Dakota: *Examination*. Vermillion, Dec. 5-6. Sec., Dr. Gregg M. Evans, 310 East 15th St., Yankton.

Tennessee: *Examination*. Memphis, Dec. 31-Jan. 1. Sec., Dr. O. W. Hyman, 62 South Dunlap St., Memphis 3.

Texas: *Examination*. April 1959. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

Washington: *Examination*. Seattle, Jan. 7-8. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

Wisconsin: *Examination*. Milwaukee, Dec. 6, Madison, Apr. 4. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

---

*Basic Science Certificate required.

DEATHS

Allen, Samuel Shelhorn Ⓜ Macomb, Ill.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; on the staff of St. Francis Hospital; died in Memorial Hospital, Carthage, Sept. 19, aged 75.

Alston, Lucius Charles, Mesa, Ariz.; University of West Tennessee College of Medicine and Surgery, Memphis, Tenn., 1918; served overseas during World War I; died in Long Beach, Calif., Sept. 16, aged 66, of arteriosclerosis.

Bernard, Melamed Benjamin Ⓜ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1909; veteran of World War I; died in the Veterans Administration Hospital Sept. 30, aged 74, of intracranial hemorrhage.

Coffman, John Marvin Ⓜ Owensboro, Ky.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; died in the Owensboro –Daviess County Hospital Sept. 25, aged 80.

Conwell, John William, Cleveland; Western Reserve University School of Medicine, Cleveland, 1918; served on the faculty of his alma mater; past-governor of the Ohio State University Alumni Association in Ohio and past-president of the Cuyahoga County Alumni Association; during World War II in the Coast Guard Auxiliary and the Cleveland Heights Civil Defense Organization; associated with the Leonard C. Hanna Pavilion of the University Hospitals of Cleveland; died Sept. 23, aged 66.

Dreiss, Adolph Martin Ⓜ San Antonio, Texas; University of Texas School of Medicine, Galveston, 1919; died in the Santa Rosa Hospital July 24, aged 64, of cerebral hemorrhage.

Engelhardt, Carolina Sylvia Ruth, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1907; a charter member of the Woman's Medical College Hospital; died in Heidelberg, Germany, Aug. 24, aged 82.

Warren W. Furey, M.D., 1898-1958.

Furey, Warren William Ⓜ Chicago, a member of the Board of Trustees of the American Medical Association, died Nov. 19, aged 60, of coronary occlusion, while attending a meeting of the Radiological Society of North America. Dr. Furey was born in Chicago Jan. 8, 1898. He received his medical degree from Northwestern University Medical School in Chicago in 1923, and interned at the Mercy Hospital. Since April 1954, he had been a clinical professor of radiology at the Stritch School of Medicine of Loyola University, where he joined the faculty in 1927 as clinical assistant in orthopedic surgery; he was promoted to clinical instructor in orthopedic surgery in March 1929, transferred from orthopedic surgery to roentgenology, as a clinical assistant in October 1930; promoted to clinical associate in roentgenology in December 1931 and was promoted to to assistant clinical professor of roentgenology in December 1944. A specialist certified by the American Board of Radiology, Dr. Furey was a member of the American Roentgen Ray Society, International College of Surgeons, American Radium, and the American College of Radiology, of which he was president in 1955 and at one time treasurer. In 1950 he was president of the Radiological Society of North America and in 1954 was presented with its gold medal and citation for his long service to medicine and radiology. In 1955 he received the alumni medal of Loyola University and the following year an alumni citation from Northwestern University. In 1948 he was president of the Chicago Medical Society. Since 1956 Dr. Furey has been president of the Tuberculosis Institute of Chicago and Cook County. From 1950 to 1955 he was president of the Illinois Medical Service (Blue Shield) and from 1951 to 1955 secretary of the Blue Shield Commission. He was chief radiologist at the Little Company of Mary Hospital in Evergreen Park, Ill., and the Mercy Hospital, and radiological consultant at Lewis Memorial Maternity Hospital. Dr. Furey was general chairman of the local committee on arrangements for the American Medical Association meeting in Chicago in June 1948; from 1948 to 1957, he was a member of the House of Delegates of the American Medical Association. In 1955 he became a member of the Council on Constitution and Bylaws and only last June elected a member of the Board of Trustees.

Ⓜ Indicates Member of the American Medical Association.

Ganey, Joseph Matthew Sr., Ⓜ Waterford, Conn.; born Nov. 8, 1878; College of Physicians and Surgeons, Baltimore, 1904; for 16 years served on the board of education and was president at the time of his resignation in 1934; served overseas during World War I and his decorations included four campaign bars on a service ribbon and a Distinguished Service Cross; in 1933 appointed to the Public Health Council of the State Health Department; in 1940 named to the Selective Service Board for New London, Windham, Middlesex and Tolland counties; for many years was with the U. S. Public Health Service, serving as quarantine officer for the Port of New London; served as Waterford medical examiner for 15 years, resigning in 1953; for many years health officer and school physician; on the staff of the Lawrence and Memorial Associated Hospitals, New London; died in Preston Sept. 9, aged 79, of coronary heart disease.

Gerwig, Henry Eugene Ⓜ Downing, Mo.; Barnes Medical College, St. Louis, 1902; died Sept. 9, aged 83, of adenocarcinoma of the prostate.

Glazer, Alfred Mirron Ⓜ Cincinnati; University of Michigan Medical School, Ann Arbor, 1929; specialist certified by the American Board of Internal Medicine; member of the Cincinnati Academy of Medicine; served on the faculty of the University of Cincinnati College of Medicine; veteran of World War II; on the staffs of Cincinnati General Hospital and the Jewish Hospital, where he died Sept. 26, aged 52.

Goggins, John William Ⓜ Chilton, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1910; on the staffs of the Calumet Memorial Hospital in Chilton and St. Agnes Hospital in Fond du Lac, where he died Sept. 16, aged 78, of cerebral hemorrhage.

Heston, Herman E., Ocoee, Tenn.; Starling Medical College, Columbus, 1896; formerly practiced in Cleveland and Columbus, Ohio, where he was chief medical examiner for the Pennsylvania Railroad; died Sept. 19, aged 83.

Higley, Charles James, Ballston Spa, N. Y.; Albany (N. Y.) Medical College, 1918; member of the Medical Society of the State of New York and the American Academy of General Practice; veteran of World War I; health officer for Ballston Spa and the town of Milton; physician for the Ballston Spa Central School and Saratoga County Jail; on the board of Homestead (Pa.) Sanitarium; on the staffs of the Benedict Memorial Hospital in Ballston Spa and the Saratoga Hospital in Saratoga Springs, where he died Sept. 7, aged 63, of acute coronary thrombosis.

Hileman, Stephen Lee Ⓜ Lincoln Park, Mich.; Detroit College of Medicine and Surgery, 1928; member of the Industrial Medical Association; served on the staffs of the Wyandotte (Mich.) General Hospital and the Delray General Hospital in Detroit; died in Gaylord Sept. 24, aged 59, in a private plane crash.

Hillenbrand, Alfred Edwin Ⓜ Detroit; Wayne University College of Medicine, Detroit, 1938; member of the American Academy of General Practice; veteran of World War II; on the staff of the Bon Secours Hospital in Grosse Pointe, Mich.; died Sept. 26, aged 49, of acute myocardial infarction.

Hilliard, Charles Wesley, Winter Haven, Fla.; Medical College of Alabama, Mobile, 1895; veteran of World War I; died Sept. 23, aged 87, of coronary artery disease.

Hudson, Wendell Phillips, Franklin, Mass.; College of Physicians and Surgeons, Boston, 1904; served on the staff of Children's Hospital in Boston; died Sept. 18, aged 78, of coronary artery disease.

Jackson, Richard Howard, Chicago; Meharry Medical College, Nashville, Tenn., 1922; died Sept. 13, aged 72, of chronic myocarditis.

Johnson, Charles Isaac Ⓜ Brookline, Mass.; born in Rutledge, Ala., June 1, 1898; University of Virginia Department of Medicine, Charlottesville, 1923; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; at one time on the faculty of Harvard Medical School in Boston; veteran of World Wars I and II; associated with the Massachusetts Eye and Ear Infirmary, Massachusetts General Hospital, Faulkner Hospital, Channing Home, and Children's Hospital in Boston; consultant, Framingham (Mass.) Union Hospital and Winthrop (Mass.) Community Hospital; died Sept. 30, aged 60, of coronary artery disease.

Jonas, Leon, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1909; an associate member of the American Medical Association; associated with the Albert Einstein Medical Center, Northern Division, and the Hospital of the University of Pennsylvania, where he died Sept. 29, aged 74, of congestive heart failure.

Keating, William Bernard, Natick, Mass.; College of Physicians and Surgeons, Boston, 1912; served with the U. S. Public Health Service; died Sept. 13, aged 73.

Kechele, Delbert Vine Ⓜ Bluefield, W. Va.; Western Reserve University School of Medicine, Cleveland, 1920; member of the board of directors and past-president of the West Virginia Cancer Society; served as treasurer of the Mercer County Medical Society; specialist certified by the American Board of Radiology; member of the American College of Radiology; served on the faculty of the Medical

College of Virginia, Richmond; radiologist at St. Luke's Hospital, where he died Sept. 13, aged 65, of a brain tumor.

Kochmann, Alfred Ⓜ New York City; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1913; specialist certified by the American Board of Otolaryngology; on the staffs of the Mount Vernon (N. Y.) Hospital and the Lincoln Hospital; drowned in Acapulco, Mexico, Sept. 25, aged 69.

Leiter, H. Evans Ⓜ New York City; University and Bellevue Hospital Medical College, New York City, 1930; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; associated with Mount Sinai and Beth Israel hospitals, and the Hospital for Joint Diseases; consultant in urology to the Veterans Administration; died Sept. 12, aged 51.

Levin, Charles Alec, Hartford, Conn.; Johns Hopkins University School of Medicine, Baltimore, 1920; a member of the courtesy staff of Hartford Hospital, where he died Sept. 26, aged 64.

Lineberry, E. Dice Ⓜ Birmington, Ala.; born in Cliffview, Va., Oct. 5, 1901; University of Virginia Department of Medicine, Charlottesville, 1926; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians and for 9 years governor of the state chapter; served on the faculty of the Medical College of Alabama; past-president of the Jefferson County Medical Society; member of the House of Delegates of the American Medical Association from 1946 to 1948; on the staff of the Carraway Methodist Hospital; died Sept. 6, aged 56, of coronary occlusion and infarction and cancer of the rectum with metastasis to lungs and larynx.

Lockwood, Howard De Forest Ⓜ Meriden, Conn.; Yale University School of Medicine, New Haven, 1901; served as president and secretary of the Meriden Medical Society; for 30 years city medical examiner; formally city health officer; served on the staff of the Undercliff Sanatorium; served as president of the medical board and chairman of the board of directors of the Meriden Hospital; veteran of World War I; member and past-president of the Meriden Rotary Club; died Sept. 25, aged 81.

Loder, Horace Bolton, Bridgeton, N. J.; Johns Hopkins University School of Medicine, Baltimore, 1928; member of the Medical Society of New Jersey; veteran of World War II; on the staff of the Bridgeton Hospital, where he died Sept. 14, aged 55.

Long, William Hunt Ⓜ Indianapolis; Indiana University School of Medicine, Indianapolis, 1908; at one time member of the city board of health; veteran of World War I; died Sept. 4, aged 76.

Loper, John C., Bridgeton, N. J.; Jefferson Medical College of Philadelphia, 1903; physician to the city schools; on the staff of the Bridgeton Hospital; died Sept. 1, aged 76, of coronary occlusion.

McHugh, William James Jr. Ⓜ Jeannette, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1943; member of the American Academy of General Practice; school physician in Jeannette; veteran of World War II; on the staff of the Westmoreland Hospital in Greensburg; an active member of the Jeannette Memorial Hospital Association; editor of the *Bulletin of the Westmoreland County Medical Society;* a director of the Jeannette Federal Savings and Loan Association; died Sept. 17, aged 44, of coronary thrombosis.

McRae, Donald Hugh Ⓜ Detroit; Michigan College of Medicine and Surgery, Detroit, 1905; veteran of World War I; on the staff of the Lincoln Hospital, where he died Sept. 11, aged 75, of cerebral thrombosis.

MacGregor, Archibald E. Ⓜ Battle Creek, Mich.; Detroit College of Medicine, 1901; fellow of the American College of Surgeons; past-president of the Calhoun County Medical Society; served on the staff of the Leila Y. Post Montgomery Hospital, where he died Sept. 17, aged 83, of cerebral thrombosis and arteriosclerosis.

Maccani, William Louis, Ironwood, Mich.; University of Illinois College of Medicine, Chicago, 1914; served as school physician and township health officer in Watersmeet for many years, and also in the same capacity for Ironwood township; served during World War I and later with the Army of Occupation; on the staff of the Grand View Hospital, where he died Sept. 10, aged 69, of cardiorenal disease.

Maldonado, Miguel Angel Ⓜ Warren Air Force Base, Wyo.; University of Puerto Rico School of Medicine, San Juan, P. R., 1955; service member of the American Medical Association; captain, medical corps, U. S. Air Force Reserve; died Aug. 26, aged 28, of a self-inflicted gunshot wound in the head.

Marasin, Theodore Louis Ⓜ Cutchogue, N. Y.; University of St. Andrews Conjoint Medical School, St. Andrews and Dundee, Scotland, 1935; veteran of World War II; on the staff of the Eastern Long Island Hospital in Greenport, where he died Sept. 22, aged 52, of cancer of the sigmoid with metastases to the liver.

Meeker, D. Olan Ⓜ Riverside, Conn.; University of Rochester School of Medicine and Dentistry, Rochester, N. Y., 1929; specialist certified by the National Board of Medical Examiners; a member of the American Medical Association Committee on Legislation representing the New England States and was in charge of the Committee on Healing Arts for New England; served as medical director of the National Drug Company in Philadelphia and resigned to become medical consultant of the Ethical Products Division of the Ferry-Hanly Company, New York advertising agency; assistant attending surgeon at Greenwich Hospital and consultant in proctology at the Nathaniel Witherell Hospital in Greenwich, Conn.; member of the Greenwich Chamber of Commerce and Civil Council, which he served as a director and chairman of the service division; a director of the Greenwich Rotary Club and past chairman of the committee on public welfare of the Greenwich Legislative Council; died in Pleasantville, N. Y., Sept. 13, aged 57, of coronary disease.

Mills, Harry Lee, Wichita, Kan.; Central Medical College of St. Joseph, Mo.; 1904; died in the Wesley Hospital Sept. 27, aged 77, of cerebral thrombosis.

Minchew, Benjamin Harvey Ⓜ Waycross, Ga.; born in Davis in 1882; Atlanta College of Physicians and Surgeons, 1909; past-president of the Medical Association of Georgia, Ware County Medical Society, Georgia Eye, Ear, Nose and Throat Association, Atlantic Coast Line Surgeons, and the Eighth District Medical Society; served as vice-president of the Georgia Department of Public Health; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association from 1945 to 1951; veteran of World War I; on the staffs of the Memorial and Atlantic Coast Line hospitals; for many years physician for the Atlantic Coast Line Railroad; died in Thomasville Sept. 14, aged 76.

Minkoff, Max, Brooklyn; Eclectic Medical College of the City of New York, 1911; died Sept. 25, aged 74, of mediastinal lymphosarcoma.

Moffitt, John Alfred Ⓜ San Marino, Calif.; University of Louisville (Ky.) School of Medicine, 1921; member of the American Society of Anesthesiologists; formerly on the faculty of the University of Oklahoma School of Medicine in Oklahoma City; specialist certified by the American Board of Anesthesiology; on the staffs of the Hospital of the Good Samaritan, St. Vincent's, and California hospitals, Los Angeles, and the Methodist Hospital, in Arcadia, where he died Sept. 24, aged 62, of cancer of the pancreas.

Moore, William Bain, Louisville, Ky.; University of Nashville (Tenn.) Medical Department, 1899; an associate member of the American Medical Association; died Sept. 20, aged 81, of myocarditis and uremia.

Morsman, Charles Frank Ⓜ Hot Springs, S. D.; born in Galesburg, Ill., Jan. 4, 1880; University of Nebraska College of Medicine, Omaha, 1902; fellow of the American College of Physicians, of which he was governor in 1949; member of the Endocrine Society, Radiological Society of North America, and the American Radium Society; specialist certified by the American Board of Internal Medicine; founder of the Dr. Charles Frank Morsman Foundation at the University of Nebraska College of Medicine, Omaha, which foundation was set up by him to further the knowledge of endocrinology; served as president of the local Chamber of Commerce; for many years attending physician, State Soldiers' Home Hospital; attending internist, Lutheran Hospital, where he died Sept. 25, aged 78.

Palen, Gilbert Joseph, Roxbury, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1895; professor emeritus of otology at his alma mater; fellow of the American College of Surgeons; served on the staff of the Hahnemann Hospital; formerly superintendent of the Margaretville (N. Y.) Hospital; past-president of the Philadelphia Rotary Club; died Sept. 6, aged 88, of arteriosclerosis.

Pomainville, Frank Xavier Ⓜ Wisconsin Rapids, Wis.; Rush Medical College, Chicago, 1899; served as city health officer, mayor, and on the board of education, of which he was for one year president; veteran of World War I; local surgeon for the Chicago and Northwestern Railroad; on the staff of the Riverview Hospital, where he died Sept. 1, aged 87, of complications following an operation.

Shapiro, David, New York City; Fordham University School of Medicine, New York City, 1915; member of the Medical Society of the State of New York; served on the staff of the New York Hospital; formerly medical director of the Lumbermen's Mutual Casualty Company of New York; died Sept. 10, aged 67.

Standard, Alphonso Perry Ⓜ Macomb, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; past-president of the McDonough County Medical Society and of the McDonough County Fair Association; served on the school board; formerly on the staff of Graham Hospital in Canton; served on the staff of the St. Francis Hospital and as chief of staff, McDonough District Hospital; charter member and past-president of the Macomb Rotary Club; died Sept. 11, aged 77, of cerebral vascular hemorrhage and embolism.

Turner, John Patrick, Philadelphia; Leonard Medical School, Raleigh, 1906; an associate member of the American Medical Association; member of the board of education; for many years police surgeon; served as trustee and in 1951 received the Distinguished Service Award of Shaw University, Raleigh, N. C.; died Sept. 14, aged 72, of coronary thrombosis.

FOREIGN LETTERS

AUSTRIA

Cystic Fibrosis.—At the meeting of the society of physicians in Vienna on Oct. 3, Dr. O. Stur reported on his experience with the plate test performed according to Shwachmann's technique and the iodized oil test performed according to Silverman's technique. The plate test, by which the increase of sodium chloride in the skin can be proved with the aid of an agar silver nitrate potassium bichromate plate, was useful in the differentiation between celiaca and cystic fibrosis of the pancreas. Differentiation could also be achieved by controlling the fat absorption with the aid of the iodized oil test before and after ingestion of a wheat-free diet and the administration of pancreatic enzymes.

Differential Diagnosis of Metastases to the Liver.—At the same meeting Dr. St. Wuketich stated that besides the known differentiation between carcinomatous and sarcomatous metastases, certain well-defined types of carcinomatous metastases can be recognized. The three main types are (1) undifferentiated (parvicellular-solid) bronchial carcinoma which is soft, homogenous, white and red-grey, interspersed, often having projecting nodules, and having hemorrhages with flat spherical segments without central indentation or with only an apparent cancerous umbilication, predominantly parvinodular, (2) the metastatic type of carcinoma of the colon with great prominence and plateau-like flattening of the nodules, macrogranulolobular structure, yellow-white due to extensive fatty infiltration and coagulation necrosis, and slight nodular confluence, mostly macronodular, and (3) the metastatic type of carcinoma of the breast, usually with only slight or no prominence of dense nodules, deep crater-like central indentation, decided confluence of the usually small individual nodules to large nodular conglomerations, generally white without extensive necrosis, and not always sharply defined. Easily recognizable are also the pigmented melanoblastomatous metastases, the hemorrhagic necrotic deposits of chorionepithelioma, and the peculiar yellow-pink metastases of hypernephroma which are often interspersed with hemorrhages. A metastatic type of endocrine carcinomas, particularly malignant carcinoids, can also be differentiated, but because only few cases have so far been observed, this is not often done.

FRANCE

Renal Biopsy.—Jean Hamburger (*Presse méd.* 66:146, 1958) questioned the innocuousness of performance of both the transcutaneous aspiration biopsy and the classic surgical biopsy of the kidney. He cited a number of accidents, particularly massive hemorrhage, from the literature. He therefore devised a mixed technique comprising in a first step the surgical approach to the outer edge of the kidney and in a second step the performance of the needle biopsy under visual control. Even though a little more complicated than the transcutaneous puncture, this technique has the advantages of direct vision, safety, and ease of performance. There was generally no hematuria, even microscopically, on the day after the operation. In the 110 biopsies so far performed in this way no accident has been noted, but the method is contraindicated when there is a hemorrhagic state or a marked renal insufficiency.

Hyperfibrinemia.—P. Croizat (*Presse méd.* 66:1471, 1958) stated that from a statistical record of 100 patients with malignant granulomatosis, lymphosarcoma, or reticulosarcoma, studied with respect to fibrinemia, it appeared that 75% of those subjects who were affected by malignant granulomatosis presented high levels of fibrinogen (5 to 11 Gm. per 100 cc.). Such values are observed in the evolutive stage of the disease, as the post-therapeutic improvements always cause the fibrin level to return to normal. Hyperfibrinemia was less severe and less frequent in reticulosarcoma and malignant histiocytic reticulosis and a little higher in lymphosarcoma.

INDIA

Kidney Function Test in Leprosy.—Gokhale and Kurkure (*Indian J. M. Sc.* 12:5 [May] 1958) stated that during the phenomenon of the reaction in the course of leprosy, exacerbations of signs and symptoms occurs which may include swelling of lesions on the hands and feet, edema of the eyelids, and such generalized symptoms as fever and malaise. The authors tested renal function by using phenol red during the reaction phase and comparing the results with those obtained during the quiescent stage of the disease. Eight patients with lepromatous and 19 with tuberculoid leprosy were thus studied. Three normal persons were included as controls. Other estimations such as the blood urea,

---

The items in these letters are contributed by regular correspondents in the various foreign countries.

serum sodium, and serum potassium level determinations were made on a few patients. Values of phenol red excretion below 28% in the first 15 minutes were taken as abnormal. They were found to be low in 14 of the 18 patients studied during the reaction phase, but the other four gave normal values. In five patients, the excretion rate increased during the quiescent phase. In seven of those studied during the reaction, the values in the first 15 minutes did not differ materially from those obtained in the second 15 minutes. The values obtained in the patients studied in the quiescent stage were definitely higher than those obtained during the reaction. Thus some impairment of kidney function is indicated during the reaction phase. The urea, sodium, and potassium values were found to be normal or slightly elevated. The degree of albuminuria had no relation to the degree of impairment in phenol red excretion, and the blood pressure was within the normal range in all patients. The edema that appears in some patients in the reaction may thus be due to impaired renal function.

Prolonged Administration of Anticonvulsant Drugs.—S. S. Gupta (*Indian J. M. Sc.* 12:5 [May] 1958) stated that the anticonvulsant drugs must usually be used for a long time and sometimes even lifelong for control of seizures in patients with epilepsy. Diphenylhydantoin sodium and phethenylate have been found to retard growth in young rats. The authors investigated the antigrowth effect, if any, of similar antiepileptic drugs on rats fed on natural stock and a high protein synthetic diet supplemented with vitamins. The effects were studied on young and adult male albino rats fed on the two types of diet. The drugs studied were diphenylhydantoin, phethenylate, phenantoin, and methadione which were given along with the diet to different batches of rats. One batch was given no drugs and served as a control. The individual body weight was recorded every week and the average change in weight in different batches calculated.

All the anticonvulsant drugs studied retarded the growth of young rats in both groups, although the result was more marked in rats fed on a low-protein stock diet. The intake was, however, not diminished in any group. Trimethadione and diphenylhydantoin caused greater reduction in growth as compared to phenantoin and phethenylate, and this difference was less marked in rats receiving a high-protein diet. These drugs were given orally for three months. During this time, the weight of the control group remained almost constant. These drugs might cause this effect by interfering with the protein metabolism by affecting phosphorylation or they might compete with certain essential metabolites. Marked hepatotoxic effects of these drugs have also been observed in experimental study, and these may also be responsible for the reduction in weight in rats fed on these drugs. Thus they interfere with cell nutrition and metabolism affecting growth and body weight, but this effect could not be minimized in a high-protein diet supplemented with vitamins is given to the children receiving these anticonvulsant drugs.

Neonatal Thrombocytopenia.—J. B. Chatterjea and co-workers reported three cases of neonatal thrombocytopenia (*Bull. Calcutta School Trop. Med.* 6:2 [April] 1958). They had followed three women with idiopathic thrombocytopenic purpura aged 34, 26, and 19 years, respectively, during pregnancy; 2 were primiparas and one was pregnant for the third time. They came to hospital because of bleeding from the gums and purpuric spots on the body in the sixth to ninth month of pregnancy. The multipara gave a history of purpuric manifestations during her previous pregnancies but had not been treated for this condition. Chronic idiopathic thrombocytopenic purpura was diagnosed in these women on the basis of symptoms and bone marrow and blood findings. The spleen was not palpable in any of the patients. All the three babies of these mothers showed severe thrombocytopenia and petechial hemorrhages on birth. This thrombocytopenia disappeared within two weeks of birth. The petechial manifestations were mild and required no treatment. This self-limited neonatal thrombocytopenia in the babies of thrombocytopenic mothers may be due to the transmission of an antiplatelet antibody from the mother to the child.

Chronic Filariasis.—Arora and co-workers (*Bull. Calcutta School Trop. M.* 6:2 [April] 1958) studied the changes in plasma proteins and lymph proteins in 15 patients between 19 and 60 years of age who had had chronic filarial lymphedema for six months to eight years. The lymph was collected from the subcutaneous lymphatics. All patients gave a history of repeated attacks of fever with lymphangitis and swelling of the part involved. In six the edema was soft and in the others hard. The leg was affected in eight, scrotum in five, and forearm in two. The total protein, albumin, and globulin levels of the collected lymph and serum were estimated. The average total protein content of the lymph from these patients was five times higher than that of lymph from subcutaneous lymphatics in normal persons. The average albumin:globulin ratio was changed from the normal 2:1 to 1.5:1. The values for plasma protein levels were within normal range. The values indicate an increased degree of stasis in patients with chronic filarial lymphedema.

Splenectomy for Leishmaniasis.—Sen Gupta and Chatterjea (*Bull Calcutta School Trop. Med.* 6:2 [April] 1958) reported on four patients with visceral leishmaniasis who were resistant to specific therapy and were subjected to splenectomy and another patient on whom splenectomy had been performed previously but who had a relapse. The ages of these patients varied between 13 and 29 years. The duration of the disease was four to five years, and the enlargement of the spleen below the costal margin measured 5 to 9 in. All of the patients showed Leishman-Donovan bodies in the bone marrow and/or spleen puncture smear. One patient died of the operation, but the other three and the man whose spleen had been removed were again given specific treatment. All were discharged as clinically cured at the end of the specific therapy. They gained weight and their hemoglobin and leukocyte count returned to normal. A follow-up after six months or more showed that the improvement was maintained and there was no relapse. The authors believe that removal of the spleen was responsible for the prompt improvement in the blood findings and general condition, but prolonged specific treatment of the underlying disease is necessary after the operation to prevent further relapse.

Carbohydrate Metabolism and Injury.—K. B. Sehra (*Indian J. M. Sc.* 12:5 [May] 1958) stated that severe trauma may cause hyperglycemia. They studied two groups of patients—one composed of those who had met serious accidents and one of those who had undergone surgical operations. Both groups were further classified as having received severe or moderate injuries. The investigations included an intravenous glucose tolerance test, determination of the glucose assimilation coefficient, insulin tolerance test, and effect of insulin on patients whose healing was delayed. Insulin was given to such patients to control the hyperglycemia, its dose depending on the response of the subject. In all severely injured persons, the glucose tolerance was found to be diminished, and it was materially altered in those with moderate injury. The more severe the injury, the higher the blood sugar level at the peak. With moderate injury, the peak of blood sugar level was slightly elevated but restoration to the fasting level was much slower than normal. In patients with severe injury, the hyperglycemic phase was prolonged. Although the responses of patients suffering from severe accidental injury and those subjected to major operations were similar, the degree and duration of hyperglycemia were greater in the first group. The glucose assimilation coefficient was markedly lowered in all but two. Further glucose tolerance tests were made on five patients on three consecutive days to find out the duration of hyperglycemia. A quick restoration of the carbohydrate level to normal was seen in all but one. A diminution in the sensitivity to insulin as compared to normal was seen in all patients. Five who had stayed in the hospital for over a month were selected for insulin treatment and the results compared with those of another group of five patients who had undergone similar injury and whose condition had become chronic. The requirements of insulin varied with each patient. After the first week, progressively smaller quantities of insulin were required to keep the patients normoglycemic. After 30 days, all of them showed a return to normal of the carbohydrate level and insulin therapy was stopped. Along with the restoration of carbohydrate tolerance, there was also a marked clinical and roentgenologic improvement at the end of one month, and a quick and uneventful recovery occurred in all patients. Those who did not receive insulin showed variable results. There was marked improvement in one, noticeable improvement in two, and no improvement in the remaining two.

New Long-acting Sulfonamide—Sulfamethoxypyridazine.—J. G. Parekh and co-workers (*Indian J. M. Sc.* 12:6 [June] 1958) stated that absorption and excretion studies with the new sulfonamide, sulfamethoxypyridazine, in human beings have shown that the drug is readily absorbed and satisfactory antibacterial concentrations are reached within the first six hours of administration and are maintained for 24 hours. As excretion is slow, the drug has to be given at long intervals. The authors used this drug in 53 patients with fever who were suffering from upper respiratory tract infection, bronchitis, pneumonia, acute bacillary dysentery, acute otitis media, and pyelitis. Besides routine clinical examination and examination of blood, sputum, urine, and stools, blood concentrations of the drug were determined in most of the patients at frequent intervals to determine whether satisfactory antibacterial levels were reached and maintained. In severe infections, an initial dose of 2 Gm. was given followed by 1 Gm. every 24 hours. In milder cases, half this dose was given. Use of the drug was continued for 24 hours after the temperature came down to normal and in patients with dysentery, after the stools became normal. Forty-seven patients responded well to this treatment. Four of those with pneumonia who did not respond to the new drug were later controlled with penicillin. On the whole the results were gratifying, and as the dosage is small and the drug has to be given only once in 24 hours, it has definite advantages over other sulfonamides. Untoward reactions occurring in four patients consisted of skin rashes, hematuria, and psychosis.

Hypotensive Sedative from Vinca Rosea.—U. K. Sheth and co-workers (*Indian J. M. Sc.* 12:7, [July] 1958) stated that the presence of a hypotensive alkaloidal fraction in Vinca rosea has been reported by various authors. This perennial plant grows abundantly all over India. The authors extracted the sundried plant with alcohol and isolated the most active fraction, which has been named V-22. It was injected intravenously in dogs, cats, monkeys, and mice. The effect of the injection was evident in dogs in 5 to 10 minutes. Urticaria and itching appeared first, followed by rapid respiration and shivering. Within 10 to 15 minutes, they became quiet, lost active interest in the surroundings, and, if left alone, went to sleep. This sedative effect lasted for four or five hours, and within 24 hours they regained normal activity. Some developed a temporary diarrhea. Similar effects were observed in cats and monkeys. In mice, sedation appeared after 30 to 60 minutes and lasted for only two hours. The effect of V-22 was studied on isolated segments of guinea pig ileum. The alkaloid counteracted the spasm of the intestine produced by acetylcholine and histamine but did not counteract the spasmogenic effect of barium chloride. It failed to have any effect on the tone and movements of the uterus in rats.

The effect on blood pressure was studied on 20 anesthetized mongrel dogs. With intravenous injection of the alkaloid, a gradual fall in blood pressure occurred, preceded by a slight rise, the fall appearing after a latent period of 30 seconds, the blood pressure reaching about 53% of the original level. The reading then returned to 68% of the preinjection level in two hours and 75 to 80% at the end of four hours. Bradycardia was observed in nonatropinized dogs. The fall in heart rate was 35% immediately after the injection and returned to the original level at the end of two hours. Bradycardia was abolished by injection of atropine or bilateral vagotomy, but the fall in blood pressure was still produced. The bilateral carotid occlusion reflex disappeared completely after injection of V-22 and returned partially at the end of two to four hours. The response to an injection of epinephrine was not altered by the injection of V-22, the blood pressure was unaffected in the case of spinal cats (cats in whom the cord has been transected). In the spinal cat receiving levarterenol by drip injection, giving V-22 caused a small fall in blood pressure which returned to the original level almost immediately. No ganglion blocking effects were noticed when the alkaloid was used on the nictitating membrane of dog. Its effect on isolated frog's heart was studied. At a concentration of 1:150,000, the amplitude of contraction gradually diminished in three minutes. With concentrations of 1:100,000 and 1:50,000, marked inhibition of the heart followed by stoppage was observed. Similar effects were noticed on isolated Langendorff leporine and feline heart preparations. V-22 probably is a mixture of alkaloids.

Action of Acetazolamide on Blood Vessels.—C. L. Pathak (*Indian J. M. Sc.* 12:7 [July] 1958) stated that the diuretic action of acetazolamide is believed to be due to electrolyte washout as a result of inhibition of carbonic anhydrase in the renal tubules. While studying the effect of this drug on heart muscle, it was found that it had a biphasic effect, stimulating the heart muscle in lower concentrations and inhibiting it in higher concentrations. The author studied its action on the smooth muscles of blood vessels, using decapitated frogs and hindleg vessels of dogs. A significant vasodilator effect was noticed in 62.5% of the trials in frogs, while in the remaining a vasoconstrictor effect was obtained. The intensity of the effect varied with the dose. A similar result was obtained in dogs, a vasodilator effect being seen in 31 and a vasoconstrictor effect in 7 trials, but the intensity of vasodilatation was less marked in vessels of dogs than in those of frogs. This variable vascular response seemed to depend on the initial tone of the vessels. Thus, if the vessels were previously in a state of constriction, a vasodilator effect was more frequently seen, and if they were previously dilated, vasoconstriction was more common. The dilator effect was also more commonly seen with small doses and the constrictor effect with large doses. Thus the drug had a significant action both on amphibian and mammalian vessels, the effect being biphasic. Acetazolamide is a powerful carbonic anhydrase inhibitor, and the latter is present in many tissues, including muscle. The action on smooth muscle may be directly on the contractile mechanism or through the carbonic anhydrase inhibitory mechanism or both may be operative at different dose levels, giving a biphasic effect.

SWEDEN

Thoracic Surgery Team Tours South America.—A group of Swedish surgeons, headed by Prof. Clarence Crafoord, left in October for a two months demonstration tour in South America. The team consisted of eight surgeons, a secretary, an operating room nurse, and two technicians; 1,400 lb. of surgical instruments, including the heart-lung machine, developed by Professor Crafoord, Dr. Ake Senning, and their technicians, were carried. The Elema mingograph, an instrument for the direct continuous reproduction of cardiac waves on a moving tape and used for the registering heart movements and blood pressure, was also taken. The team visited Argentina, Brazil, Uruguay, and Chile.

The Linnaeus Autobiographies.—Five autobiographies were composed at different times by Sweden's great botanist, Carl von Linné, who was also a physician and all-around scientist. At the instigation of the University of Uppsala, Malmeström and Uggla collected and edited these autobiographies, which are published by Almquist and Wiksell of Stockholm. Linnaeus was only 27 when he completed his first autobiography. His second followed 13 years later. Most of his third and longest autobiography was dictated to his disciple, Peter Löfling. A reason given for his fourth autobiography was that as a newly elected member of the Academy of Sciences in Paris in 1762 he had to present it with a review of his life's work. He may, perhaps, have been possessed by vanity, as suggested by the secretary of the French Academy, but he was also driven by an urge to get to the root of whatever he studied, and his study of himself could not fail to reveal a man of gigantic talents. Elected a member of 19 academies and corresponding with hundreds of fellow scientists all over the world, his intellectual industry was prodigious, and if at times he took his hat off to himself, his fellow beings should rather follow suit than grudge him this homage to genius.

Treatment of Delirium Tremens.—*Svenska läkartidningen* for Sept. 26 contains a report on hydroxydione sodium succinate by several members of the staff of the Beckomberga Hospital, which has a special department devoted to patients with delirium tremens. Here, various steroids have been tested since 1952, but the death rate was high (2 of 8 patients so treated in one six-month period and 4 of 14 in another died). With the introduction of hydroxydione, a synthetic steroid with a strong sedative and anesthetic action, there were no deaths among 15 patients. The present report concerns seven particularly severe cases treated successfully. The drug was given as a 0.1 to 0.4% solution with 5% glucose in Ringer's solution as a slow intravenous drip under continuous supervision by a physician. The total amount of the drug varied from 1 to 6 Gm., and the treatment was maintained for 5 to 22 hours. In every patient profuse sweating, muscular twitching, and general tremors disappeared soon after the injection was started. Thrombophlebitis developed invariably in the recipient vein, but it passed off in a few days without special treatment. There were no other complications. Though hydroxydione is said to reduce the blood pressure, the general circulation improved in this group of patients.

Smallpox Vaccination.—According to Dr. A. Espmark (*Svenska läkartidningen*, Oct. 3, 1958) the chief hazard of smallpox vaccination is encephalitis. This risk is less in Sweden than in many other countries, but it is not negligible. In the decade 1948 to 1957, 25 cases of postvaccinal encephalitis were reported with only two deaths, whereas elsewhere this disease has shown a case fatality rate of about 40%. In Sweden, as elsewhere, those aged 6 and 7 showed a greater liability to this complication than did the younger children, but by and large the risk after primary vaccination may be put as low as 1 in 50,000 in Sweden. Espmark noted that recent comparisons of the scarification and multiple-pressure methods of vaccination have been most favorable for the latter, with 83% effective vaccinations as compared with 74% for the scarification technique. The recent introduction of plastic ampuls as containers of vaccine has helped to facilitate the dosage and technique of vaccination.

The Shortage of Physicians and Nurses.—The shortage of district health officers is so great that 9 of 30 such appointments are vacant in one county and 9 of 24 in another. As for the mental hospitals, only about 50% of their medical staff are fully qualified for the posts they hold, half being vacant or held by stopgaps. As for the shortage of nurses, it is the worst problem confronting medicine at present, with whole hospital departments closed for want of nurses. Yet in Sweden there are 27 schools of nursing which in 1957 graduated 1,450 nurses. Two services are especially handicapped by this shortage. The one deals with patients who have chronic diseases for whom the calls made on nurses are often most exacting. The other is the teaching hospital with patients whose ailments may require highly specialized nursing and frequent rounds by the physicians in charge. Two new schools of nursing, planned to serve the County of Stockholm and the town of Malmö, respectively, will, it is hoped, help to relieve the present shortage.

Treatment of Venereal Disease at Sea.—In the Swedish merchant service the care of the sick on board ship is usually allotted the second mate who is required to keep a log of his medical activities. He must have had 40 hours of medical training before taking his mate's certificate and another 40 before his captain's certificate. About 10 of these hours deal with venereal diseases. To find out how he has fared with this background, 56 mates from Swedish vessels were questioned with regard to their experiences in 1957. Their answers were analyzed by Dr. A. Björnberg and co-workers (*Svenska läkartidningen*, Oct. 3, 1958). In addition to the 365 men treated for a urethral discharge, 32 were treated for genital sores and 6 for inguinal buboes. Penicillin was given in most cases, and it was exceptional for streptomycin, chlortetracycline, and sulfonamides to be given. Only three of the patients with genital sores received more than 1,000,000 international units of penicillin, so it is probable that the dosage was usually inadequate for syphilis, but it was presumably adequate for gonorrhea. Fourteen mates had given prophylactic treatment with penicillin by injection or in tablet form as a matter of routine after shore leave, with what were presumably dubious results; 15 had neglected to advise their patients to undergo a medical check-up later; and 16 had failed to keep any record of their therapeutic activities. The questioning of these 56 mates left the general impression that stricter rules for treating venereal disease on board ship are desirable. Prophylactic tinkering should be discouraged, and when treatment is given the patient should receive an explanatory pamphlet on venereal disease and should be advised to obtain a medical check-up as soon as possible. Treatment of venereal disease by ships' mates should always be regarded as an emergency measure and should not be undertaken when treatment by a physician is available.

CORRESPONDENCE

TOXICITY OF IPRONIAZID

To the Editor:—As one of many clinicians who has had gratifying and often dramatic results with iproniazid in the treatment of depressions and melancholia, I welcomed the editorial concerning this drug in The Journal (168:50 [Sept. 6] 1958). I wish to comment on two points discussed in the editorial—dosage in relation to toxicity and the risk versus the severity of indication. Concerning the first point, the statement that "because the incidence of toxic manifestations (particularly jaundice) may be dependent on dosage" is not borne out by the evidence. From a thoroughgoing study of the reported incidence of hepatitis and fatalities from hepatonecrosis during iproniazid therapy, it is unfortunately clear that no dosage-toxicity relationship can be demonstrated at the present time. The implication that only in institutionalized patients is adequate supervision possible and a maximal initial dose of 150 mg. warranted is also not in keeping with clinical experience.

Dr. Nathan Kline and I have emphasized repeatedly that a starting dose of 150 mg. is, in fact, necessary whether the patient is treated in or out of a hospital. If an inadequate dose is given, the response to iproniazid may be delayed to the point of greatly increasing the danger of suicide, thereby defeating the very purpose of therapy. In our efforts to discover means of eradicating the factors that may induce hepatitis, we have found that by adjusting the dosage downward soon after treatment is started, it is reasonable to expect the prevention of adverse side-effects; yet it may not be possible to prevent these in the rare supersensitive patient.

Weighing the risk against the severity of the indication is another case in point. It is worthy of mention that, on the basis of the reported suicidal deaths in the United States (an incidence of 10 per 100,000 in 1956), deaths erroneously reported as accidental, and unknown cases which escape diagnosis, it is estimated that more than 20,000 will destroy themselves this year. It is well known that many suicides occur among people with frank mental illness, notably depressions. In a recent British study depression was diagnosed in 72.5% of men and 73.8% of women attempting suicide in two hospitals in Oxford, England. In an American study an analysis of case histories covering neurotic, psychotic, organic, and miscellaneously classified subjects, a diagnosis of reactive depression or of paranoid schizophrenia distinguished all suicidal patients.

In an editorial in The Journal (150:696-697 [Oct. 8] 1952), calling attention to suicide as a leading cause of death, deep moods of depression, active conflict, anxiety, and withdrawn resignation are emphasized as especially significant in persons with suicidal inclinations. If we make the conservative assumption that only a third of the 20,000 estimated suicidal patients for 1958 are suffering with some degree of depression we can speculate on what might happen if these 6,000 patients were placed on therapy with iproniazid. According to the present estimated morbidity and mortality figures associated with iproniazid therapy, a maximum of two of these 6,000 patients might be expected to develop jaundice. These two patients then have a 75% chance of surviving hepatitis without serious consequences. Let us assume for the moment a 10% efficacy of iproniazid treatment in depressed patients (and some have claimed better than 80% effectiveness of the drug). In that case of 6,000 patients, roughly 600 would have a chance to survive 1958 without committing suicide, if they were treated with iproniazid. Actually, we may expect that many more than the 600 might remain alive if iproniazid were administered to all who were depressed.

A comparison with another mode of treatment of depressions, i. e., electroshock therapy (EST), will disclose that the "calculated risk" of mortality is markedly less with iproniazid than with EST which, as demonstrated by Impastato, is 1 per 1,000 patients treated with EST. From the most reliable statistics available, Jolly estimated that the mortality with iproniazid is 1 in 16,000 to 25,000 patients under treatment. Thus, according to our present knowledge, iproniazid is at least 16 times safer than the only other acknowledged treatment for preventing suicide in melancholia. Quite apart from mortality is the fact that during EST the necessary loss of time from employment (5 or 6 weeks) may militate against the patient's retaining his job, a factor crucial to eliminating the melancholia and to preserving his life. Furthermore, one can hardly ignore the economic factor involved, both in the loss of time from work and the three times higher cost of EST, as compared with that of iproniazid therapy.

Pursuing the argument of extent of risk, it is enlightening to examine the case for tonsillectomy, the most common of surgical procedures. Based on several studies, the death rate is reported to be from 1 in 2,000 to 1 in 10,000. Yet, tonsillectomy is considered a safe procedure. In various other frequently used medical and surgical procedures, mortality is a calculated risk of even a higher order.

T. R. Robie, M.D.
676 Park Ave.
East Orange, N. J.

SOCIAL SECURITY—BARGAIN OR BUST

To the Editor:—The activities of the 85th Congress have been fateful ones for the medical profession. We have witnessed a budget battle, an economic recession, a lifted debt ceiling, plus the menace of inflation and a further devaluation of the dollar—an atmosphere ideal for perpetuation and expansion of the welfare state and the further invasion and partition of American medicine by the federal government. The disposition of the Forand Bill in no way mitigated the danger, for one can be sure that similar bills will be introduced in the near future.

There are only two ways to expand any welfare program: one, by larger cash benefits and, two, by providing greater service. The only social security field not yet exploited is that of medicine, nursing, and hospital care. Even here the door is not securely closed, for Medicare is constantly expanding, and fixed fees for services are the pattern of health insurance companies. In the 85th Congress more than 600 such bills were introduced bearing directly or indirectly on the profession. Over half dealt with amendments to the social security act and deferments or exemptions for health and welfare pensions.

If social security is such cheap insurance, why would any individual or group oppose it. To illustrate, let's take a young physician under 30 years of age. He selects a life insurance policy which meets his personal needs and, before signing, knows the annual premium and exact benefits and has a waiver of premium which will continue coverage without further cost should he be incapacitated for a prolonged time. To prevent any misunderstanding, he has a written contract backed by the strongest laws in the country. Further, his policy may be dropped or added to at his own discretion, has a definite cash value, and represents a nationally acceptable form of collateral.

By contrast, should compulsory social security for physicians become a reality, the same young man would become part of a system with an accrued liability of over 300 billion dollars. He would have no contract and would be subject, without recourse, to changes in both the tax rate and tax base. He would be forced to continue contributions unless the law was repealed or the system collapsed. His so-called insurance would have no cash or collateral value, and he could not, as he saw fit, indicate the beneficiary if, in fact, there be any at all. Being self-employed he would not have the advantage of taxes paid on his behalf by an employer. He would, in fact, be required to pay the full employee tax plus one-half of what an employer would pay. Should he be married and die, his widow will receive $225 for burial and nothing more until age 62, unless she has children under 18. Should it be necessary for her to work, her earning capacity is limited to a set sum if she is to receive benefits.

The doctor may well ask how all this came about and how social security, which was originally intended to provide "a floor of protection" for a small group, is now a giant threat to personal saving and likely to eventually turn the entire population into government wards in any medical emergency and in old age. A clue to the answer may be found in the following statement: "Twenty years ago social security was thought of as just a guarantee of bread. Today most Americans depend on it as the foundation of their retirement plans." Dr. Burrill B. Crohn feels that if the constant demand on physicians to certify people over 50 years of age as completely disabled in order to collect social security continues, we'll make fools of ourselves and further bankrupt the social security system.

Robert B. Marin, M.D.
85 Park St.
Montclair, N. J.

INTERNSHIP

To the Editor:—Recently (*J. A. M. A.* 168:693-694 [Oct. 4] 1958), there appeared another article on the problem of internships. This problem has been stated by all parties concerned except the one most important and most inarticulate—the intern. From his standpoint, the shortage is fictitious. Hospitals which consider him a service will always have trouble filling, and nothing can or should be done to ease their plight. Actually, they should be removed from the approved list.

The only really justifiable purpose of the internship (other than the iatrogenic one of fulfilling the law of the state in which one desires to practice) is to provide a continuation of practical education. This is well worded by Jeghers (*New England J. Med.* 259:718-720 [Oct. 9] 1958): "Didactic knowledge and work experience gained in student days in medical school have no permanent value until the physician intern assumes the responsibility for their application, and is permitted to make independent decisions, subject to careful scrutiny by those who guide and supervise him." Hospitals which provide this opportunity have no difficulty in "filling" their quota of interns. Indeed, "spots" on the house staffs of such hospitals are eagerly, competitively sought after.

There are, however, only two kinds of internships. One kind is the "teaching" internship—so much teaching that the intern has no time to learn—lots of conferences, journal clubs, and lectures. The other is the "doing" type. In this type he has almost unlimited responsibility, is "turned loose," and learns from his errors or stumbles along constantly in error—overloaded with work. In their extremes, both serve their purpose and usually "fill," each with the types of personalities which uniquely fit into such situations. Then there are the internships which combine the undesirable features of each. They provide little or no teaching and little chance for actual practice. The word quickly gets passed around, and soon these hospitals are experiencing the much publicized "intern shortage."

The ideal internship would combine the desirable features of each. It would be rich in clinical material, afford opportunity to assume responsibility, and have an enthusiastic teaching staff for guidance. This internship would fill easily. There are too few of these. In fact, I have not found one!

John H. Koning, M.D.
2836 The Mall
Los Angeles 23.

MISCELLANY

NOAH WEBSTER—EPIDEMIOLOGIST

Herbert Thoms, M.D., New Haven, Conn.

Philatelists who collect stamps bearing a relation to medical history should interest themselves in the 4 cent Noah Webster bicentennial stamp in the "Famous American" series placed on sale Oct. 16, 1958, in West Hartford, Conn., Webster's birthplace. Noah Webster's great contribution to medicine was his study of epidemiology, particularly that of yellow fever. It was the terrible epidemic of this disease in 1793 in Philadelphia that chiefly stimulated his interest in the problem. He had observed epidemics in New England before this, influenza in 1789 and in 1790 and scarlet fever in 1793. Webster collected a large part of his data by means of circular letters sent to physicians in all parts of the United States and by extensive correspondence with leading teachers of medicine. By January, 1798, he had collected the literature on epidemics throughout the world by visiting libraries in New York and Philadelphia and at Harvard and Yale. On April 10th of that year he wrote in his diary, "Begin to write up my History of Epidemic diseases from material which I have been three months collecting."

The next year, in December, 1799, the "History of Epidemic and Pestilential Diseases" was published at Hartford. It had no great popular success and the author himself two years later estimated that he was out of pocket some $800 on its account. Nevertheless, according to the late C. E. A. Winslow,[1] these two volumes represent the best general summary of epidemiologic opinion at the beginning of the 19th century. According to this authority, "The first step in any science must, however, be the stage of observation. Noah Webster labored at this stage of epidemiology. He was dominated by theories which were inadequate and his methods of analysis were essentially unsound. In both of these respects he represented the age in which he lived. He understood, however, the vital importance of factual data." The essence of Webster's contribution to epidemiology is found in his own words, "As facts are the basis of human knowledge, it is of great importance to collect them. There are probably in every profession, facts enough which occur every year, in our extensive country, to constitute a mass of information, if collected, equal to what a long life of experience would be necessary to acquire for any one man. If not collected these useful facts are lost to all the profession, except to few individuals; if collected, they condense the knowledge of a whole life into the compass of a few hours reading. This might be done every year, and what could be more useful?"

Noah Webster was a man of highest vision during the years of this country's greatest expansion. He was truly representative of what Edward Weeks calls the "bigness of one" at a time when for America everything seemed to be on the move—in education, letters, science, medicine, exploration, and political life. This has been called our golden era, times that produced great men and vice versa, but no one outshone Noah Webster in his ability to bring his advanced thinking into practical application. He believed in a glorious future for his country and spent his life doing something about it.

Webster's studies in epidemiology were made when he was in so-called retirement but never was a word so misused. In 1798 he had given up

---

Emeritus Professor of Obstetrics and Gynecology, Yale University, and Curator, Yale Medical Memorabilia, Yale Medical Library.

his editorship of *The American Minerva* (later *The Commercial Advertizer*) which had kept him in New York for the previous five years. He had come to New Haven to devote himself to what he called literary pursuits. To be listed among these activities was serving in the General Assembly for nine sessions (1800-1807), as Councilman of New Haven (1799-1804), as Alderman (1806-1809), and as Judge of the County Court from 1806 to 1810. In 1812 he removed to Amherst, Mass., and it was not long before he was serving as a member of that commonwealth's General Court (1814, 1815, and 1817).

By 1822 Noah Webster was back in New Haven, and here until his death in 1843 he made his home. His house, formerly on Temple Street, is now one of the buildings reassembled at Greenfield Village, Dearborn, Mich.

Robert French[2] gives us this picture of his final years:

> It was a full life on the whole, which this homespun scholar made for himself, with the gay serenity of Becca (his wife) smoothing the sharp edges of his individualism. He was sixty-six when he finished his dictionary, and he gave the rest of his life to the labor of revision, getting out one further edition before his death. He died while still at work upon his great book, on the eighth of May, in 1843, at the age of eighty-four. As we look back upon the labor he performed, his slight figure, in the sober black, he seems to grow larger and to take on richer colors. This little man, too, was one of the giants of our early history. By his sole strength he wrought great things, in the face of many difficulties, and built his personality into the foundations of our country.

It is interesting that the town of West Hartford has given birth to two distinguished epidemiologists, neither of whom practiced medicine nor had a degree of doctor of medicine, Noah Webster and William Thompson Sedgwick. Both were Yale graduates, Webster in 1778 and Sedgwick almost a century later in 1877.[3]

As an epidemiologist Webster has specific interest for those of us in medicine, but be is known world-wide as our greatest lexicographer. At various times in his career he was soldier, schoolmaster, lawyer, lecturer, journalist, editor, legislator, and statistician.

Fortunately for Noah Webster, in his "retirement" he was financially secure due to the publication of his famous spelling book. Some idea of this best seller can be gained from the fact that by 1865 its sales had reached 42 million dollars. Nothing very spectacular about Webster's college career has been recorded except the day when Washington visited New Haven on his way to take command of the American Army before Boston, on which occasion Webster played a fife for a company of students that escorted him to the edge of town. At another time, a year before his graduation in 1778, he marched as a volunteer in his father's militia company against Burgoyne, being met on the way by news of his surrender.

On leaving college Webster taught school in Hartford, at the same time reading law, and was admitted to the bar in 1781. As no openings in that profession seemed to appear, in May, 1782, he opened up a select school at Sharon, Conn., and later taught at Goshen, N. Y. It was in the latter place that he began the compilation of elementary textbooks for teaching the English language, the spelling book, grammar, and reading book, which were to make his name a household word. In 1783 he was back in Hartford arranging for the publication of these works. His teaching days were not over, for he spent the year of 1787 at Philadelphia at an Episcopal academy. Two years later he was back in Hartford, this time as a lawyer, and in 1789 he married Rebecca Greenleaf of Boston. In 1793 he removed to New York to the editorship which has been mentioned.

In the revision of his most famous work, the dictionary, he had assistance from many quarters. For us it is interesting that two of his more important collaborators were Dr. Thomas Miner of Middletown, "perhaps the most learned physician in New England," and Dr. James Gates Percival of New Haven, the astonishing linguist, physician, geologist, and poet. The former was co-author with William Tully of the widely read "Essays on Fevers." The latter devoted some years to the reading of proof sheets of Webster's dictionary and, according to his own testimony, took more pleasure in the work than anything else that he did in his extraordinary and complicated life.

The Webster likeness on the new stamp is a reproduction of a lithographed print of a painting by James Herring (1794-1867), a London-born American artist who did a number of canvases of Webster. It was engraved by George Parker of the Bureau of Engraving and Printing.

References

1. Winslow, C. E. A.: Epidemiology of Noah Webster, Transactions of Connecticut Academy of Arts and Sciences, vol. 32, New Haven, Yale University Press, 1934.

2. French, R. D.: Memorial Quadrangle: A Book About Yale: Including Biographies of 43 Eminent Yale Men, Written by Various Hands, New Haven, Yale University Press, 1929.

3. Dexter, F. B.: Biographical Sketches of Graduates of Yale College, with Annals of College History, 1778-1792, New Haven, Yale University Press, 1907.

BUSINESS PRACTICE

This is the seventh in a series of excerpts from the brochure on the Business Side of Medical Practice, prepared by the American Medical Association in cooperation with the Sears-Roebuck Foundation.

PROVIDING GOOD MEDICAL SERVICE

When a doctor has equipped his new office, he must set up the kind of operation that will enable him to provide the best medical service including systems to assure telephone accessibility; receive patients and make appointments; record medical information; and provide laboratory and diagnostic services.

Telephone Accessibility

The telephone has become the lifeline to a physician's practice. Unless patients can get in touch with their doctor quickly, valuable minutes can be lost with tragic consequences and the kind of rapport a physician seeks to develop with his patients destroyed. In the early days of his practice, the sound of the telephone is a happy one to a doctor—eventually he may come to regard its ringing less joyfully. But he is bound to it by his profession; it is an ear-oriented radar on which his comings and goings are traced by his patients, the hospital, and his family.

Like the installation of any other piece of office equipment, the physician will want to give thought to placing telephones where they are most easily accessible. Even though he may not employ a receptionist to take incoming calls during the early days of his practice, he will want to provide for the day when he does. Placement should assure a maximum of privacy for all conversations. The telephone company can offer good suggestions regarding installation and placement. There is also some special new equipment—devices to cut down conversational carry-overs and receiverless phones which the physician may also wish to investigate.

To cover his practice around the clock, the physician probably will want to subscribe to some form of telephone answering service. Such services answer all calls phoned to the doctor's office after office hours via a special outside switchboard. When the doctor leaves his office, he telephones the answering service and asks them to take over his calls, notifying the switchboard about where he can be reached in an emergency. The answering service records information on all calls and relays messages to the M.D.

There are various kinds of telephone answering systems, some commercially operated, others run by medical societies. The reliability of an answering service should be checked before subscribing to it.

Special equipment is also available in areas where no answering services exist. A recording device can be secured and attached to the office telephone which automatically answers the phone and notifies the caller that the doctor is out. A recorded voice invites callers to leave a message, or the doctor himself, may record a message which he dictates into the machine before he leaves and which is relayed mechanically to all callers. Some physicians in isolated sections even are installing radio equipment or mobile telephone systems in their cars so that messages can be transmitted to them while they are in transit. In a few large cities, a service "pages" a physician with a tone signal from a small pocket receiver he carries with him. The signal sounds to notify him to call his home or office for messages. All these plans are part of an effort by the medical profession to make sure a patient can reach his own doctor or secure substitute medical service in an emergency.

Formal medical society emergency programs, utilizing various telephone answering system arrangements, are being conducted in many parts of the United States. Via these programs, the medical society either locates the patient's own doctor or puts the caller in touch with another physician who will accept an emergency summons. Usually all members of a medical society, regardless of specialty, are asked to serve on the society's emergency call panel for a night, a 24-hour period, or other short intervals; that is, they are asked to stand by during these times to take emergency calls from persons who cannot reach their own doctors or who have no physician of their own. Many medical societies rely on new physicians to help operate such emergency call programs since younger men have more time available. The acceptance of emergency calls from persons without doctors may also help to build the practices of younger men.

Phone Book Listings.—The county medical society can inform a physician of the custom locally in regard to listings in the telephone directory. In some places physicians are listed by name only; in others, specialty listings are customary. Many doctors list both their office and home phones, but it is possible to arrange with the telephone company to divert office calls to a physician's home when the office does not answer. This enables a physician to retain a certain degree of home privacy, yet gives him round-the-clock telephone coverage.

The importance of utilizing the telephone properly cannot be overestimated in medical practice. The telephone should never be left unattended. A pad and pencil should always be placed beside it so that all messages can be jotted down. Courtesy should be a telephone by-word in the medical office and techniques for handling all calls worked out in the best public relations manner. Additional tips for telephone technique can be secured from the A. M. A.'s Department of Public Relations and from its publications, such as "Rx Public Relations" and "Winning Ways with Patients," available on request.

Receiving Patients and Scheduling Appointments

Even though a new physician cannot always arrange for a full-time receptionist to greet all callers to his office, he should work out some means of welcome. He himself may be busy with other patients in the inner office and be unaware that someone has entered the reception room. Patients who enter a deserted waiting room are uncertain of how to signal the doctor that they have arrived. A register in the reception room with a sign saying, "Please sign the register when you arrive. Doctor will see you shortly," or, "Please ring the bell for the receptionist and be seated. The doctor will see you in a few minutes," is reassuring and the next best thing to a personal welcome.

The doctor who employs a receptionist should train her in the art of welcoming patients. Her desk should be placed so that she can see all newcomers yet converse with patients with some degree of privacy.

Seeing Patients on Schedule.—Although some physicians in rural areas still prefer to hold "general office hours," more and more medical men today work by appointment system. Even though emergencies make it difficult to conform to a rigid appointment schedule, a flexible system is more widely accepted today for several reasons: 1. The doctor can make more efficient use of his own time when he works according to a prearranged schedule. 2. He can see more patients with less strain. 3. He can work with a smaller, less costly reception room when he does not have to accommodate all the patients who arrive under a "general office hours" system. 4. He saves the patients considerable waiting time and thus eliminates one of the biggest complaints about the medical profession.

Good management calls for making the best use of your time. Efficient scheduling of appointments reduces the strain on the doctor and increases his ability to give his patients the best medical service. A professional management official reports that a physician who switched to the appointment system saw one-third more patients in a month's time than previously, but he was not aware of it because he did not feel pushed.

Here are some tips for scheduling appointments efficiently: 1. Arrange office hours to fit community needs. Some doctors hold evening office hours two or three times a week for the convenience of working patients. 2. Schedule all appointments tactfully, considering the patient's desires. 3. Use an appointment book marked off in given time intervals. Adjust the schedule to fit the practice, allowing ample time for various types of visits, such as first visits, check-ups, specified procedures. 4. Don't make conflicting appointments. 5. Don't overcrowd the schedule. Allow two or three "breathers" during the day for catching up or resting. 6. Schedule house calls realistically at hours not conflicting with office hours. 7. Fit referred patients and patients without appointments into your schedule as best you can. 8. When it is necessary to refuse an appointment, always explain why. 9. When an emergency takes the doctor out of the office, explain the situation to waiting patients; give them the choice of waiting or returning at another time. 10. If it is necessary to cancel an appointment, notify the patient and make a new appointment. 11. Give the patients written or oral reminders of appointments.

Every physician wants his patients to feel that, when they really need him, he is available. But he must impress on his patients that the emergency should be a real one, not merely an excuse for not having made an appointment. Both the physician and his receptionist must learn to evaluate all so-called emergency calls properly. Some calls can wait until morning; others require immediate attention. Best advice for new physician: when in doubt, check it out!

Medical Records

To preserve all the necessary information about patients, their illnesses and treatments given or recommended, the physician must maintain accurate, detailed medical records. Good records not only protect the patient, assuring continuity to his care, but protect the physician should he have to go to court in connection with a professional liability or insurance action.

Medical records provide a continuous story of a patient's progress. To the physician's own case history are added reports of laboratory tests, x-rays, and other data completing the medical picture. All this information provides important clues to diagnosis and treatment.

Types of medical records vary, depending on the doctor's specialty. For example, the general practitioner and internist will keep more detailed records than the dermatologist or radiologist, who may see a patient only on a referral basis. Printing companies offer a variety of record forms.

In offices where detailed histories are not necessary, cards of various types can be used to record vital information. On these cards such information as the patient's name and address, chief complaint, onset and course of the condition, and findings of physical examinations and laboratory tests, as well as diagnosis and treatment, can be listed.

Space is limited on such cards, and consequently more medical offices are using letter-size forms on which more information can be recorded. Forms designed for various specialties can be obtained, though some physicians prefer to draw up their own forms and have them printed to order. Some doctors do not use a printed form but develop an outline for taking case histories. The information secured from patients is later typed on regular paper and filed.

Whatever form of medical record a physician adopts in his office, it should contain the following kinds of information:

1. General information about the patient: full name (correctly spelled), home and office address, telephone number, date of first visit, age, marital status, occupation, name of person responsible for the medical bill, and the name of the person who referred the patient.

2. Information about the patient's past medical history: illnesses, operations, physiological defects, allergies, and personal health habits.

3. Information about the patient's family: physical condition of members of his family, past illnesses or diseases of individual members, and causes of death of family members. Such information may show important heredity patterns.

4. Patient's own complaint: symptoms, nature of pains and duration, exact, brief account of onset, any self-treatment the patient gave himself, report of other medical treatment he may have secured previously for the same condition, and his opinions about possible causes for his troubles.

5. Reports of physical examinations and laboratory and x-ray findings. Special forms for recording findings on physical examinations are available, and reports of other tests, often recorded on various colored slips should be attached to personal histories. This type of information varies with specialty.

6. Diagnosis: physician's evaluation, based on all information and examination findings.

7. Treatment prescribed and results obtained: suggested treatment, instructions to patient regarding follow-up treatment within a specific period of time, information on patient's progress after each visit, any changes in therapy or medication, and patient's own report about his condition, as well as date of discharge. This information is particularly important in the event of malpractice actions.

Medical records should also carry information about advice or reports given by telephone and notations should always be made during house calls which can be transferred later to the office record.

A daily procedure for record-keeping should be established early in a doctor's practice. Experience has proved that it is best to separate medical and financial records kept on each patient. Although it may appear to be simpler to record both kinds of information on one card to save the extra handling the possibilities of losing records, and the added inconvenience when the doctor and his aide compete for it at billing time are factors against a one-card system. Furthermore, the confidential medical record should not be exposed to individuals who some day may be examining the doctor's accounts.

Medical records should be filed where they are easily accessible, with all information about each patient organized in an individual folder carrying his or her name. Some physicians microfilm medical records for easier storage. It is advisable to investigate and compare the cost of standard filing cabinets of fireproof design.

Filing space should be considered in terms of estimated practice growth over a period of approximately 10 years. It is wise to tighten up the filing system periodically by weeding out "dead" material and storing it elsewhere.

Files should be placed out of the reach of patients' eyes. Lack of privacy is one disadvantage to low-cost, space-saving, open shelf filing in which envelopes of case histories are stacked upright or flat on cabinet tiers. Some office equipment manufacturers, however, offer such cabinets with shields for security. Sometimes it is desirable to use a numerical system with patients' names coded to assure files remain confidential. This is especially important when files must be located in the reception room.

Medical records belong to the physician, not the patient. They are his own notes. Such information or laboratory reports should be transferred only to doctors to whom patients are referred. Some physicians, however, give patients copies of certain records so that they can maintain a personal health record. This is done to encourage continuous attention to good health. The A. M. A. now provides a family health record booklet and a health identification card free of charge in quantity to physicians for their patients.

Laboratory and Other Diagnostic Services

Early in his practice, the new physician will want to establish contact with a reputable laboratory and with other agencies which provide necessary allied medical services needed by his patients. He also should find out as much as possible about the various medical facilities offered in his community, since these services, along with laboratory services, are an integral part of providing good medical service today. Once again, the county medical society can guide him in making the selection of proper, recognized facilities and securing information about services available locally.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

A Study of the Effects of Type A (Asian Strain) Influenza on the Cardiovascular System of Man. J. Walsh, G. E. Burch, A. White and others. Ann. Int. Med. 49:502-528 (Sept.) 1958 [Lancaster, Pa.].

The authors report on 12 male and 22 female patients, between the ages of 12 and 70 years, who were admitted to the Charity Hospital of Louisiana, in New Orleans, during the height of the epidemic of Asian influenza in July and August, 1957, and in whom the diagnosis of Asian influenza was readily established on the basis of clinical data alone. Laboratory confirmation was also obtained in 30 of the 34 patients. The 34 patients were divided into 2 groups. The first group consisted of 30 patients with typical influenza uncomplicated by clinically evident cardiovascular disturbances. The second group consisted of 4 patients with influenza complicated by clinically significant cardiovascular disturbances.

In 26 of the 30 patients without clinically significant cardiovascular complications, specific diagnostic tests, such as roentgenologic examination, hematological studies, bacterial agglutination tests, hepatic and renal function tests, lumbar puncture, determinations of serum enzymes, fluid and electrolyte studies on urine specimens, and bronchoscopic examination, substantiated the diagnosis, with the usual reservations concerning the diagnosis of viral diseases. At the height of the illness 23 (about 75%) of the 30 patients had digital vasoconstriction as well as abnormalities of the T wave in the standard electrocardiogram and of the QRSsÊ-loop in the spatial vectorcardiogram. These changes usually disappeared with convalescence.

Of the 4 patients with clinically significant cardiovascular complications of Asian influenza, 2 had rheumatic mitral stenosis. Severe infection in a patient with mitral stenosis and sufficient impairment of cardiac reserve or a critically reduced mitral orifice can produce cardiac insufficiency, and that was probably true in one of these patients. Dyspnea and orthopnea which occurred in the second patient suggested congestive heart failure, but they subsided with bed rest, restricted intake of salt, and administration of mercurial diuretics. The third patient, a pregnant woman, almost died within 24 hours of the appearance of the first symptoms of influenza. At the height of her illness she appeared to have acute pulmonary edema. Energetic therapy was effective, and no residual damage was observed. The fourth patient had a severe attack of acute rheumatic pancarditis, complicated by congestive heart failure. This attack may have represented reactivation of rheumatic fever by an unconfirmed streptococcic infection complicating influenza, or smoldering rheumatic activity that manifested itself as a result of the influenzal infection. The influenzal infection seemed to be of considerable importance in producing the cardiac manifestations.

The Syndrome of the Suspended Heart. B. A. Bradlow and M. M. Zion. Lancet 2:501-503 (Sept. 6) 1958 [London].

The occasional finding of abnormal electrocardiograms in patients without manifest cardiac disease may cause much difficulty, since without autopsy evidence of a strictly normal myocardium one cannot state that the electrocardiographic disturbance is not associated with heart disease. In 1957 Evans and Lloyd-Thomas, under the title of "the syndrome of the suspended heart," presented evidence of the association of certain specific electrocardiographic "abnormalities" with a particular radiologic configuration of the heart. The authors present 3 further cases of the "syndrome of the suspended heart." One patient was a 12-year-old girl; the second was a 24-year-old woman; and the third was a 41-year-old man.

The electrocardiograms of these patients showed abnormal S-T segments and T waves, suggesting infarction of the lateral and posteroinferior portions of the left ventricle, or of left ventricular strain without abnormal voltages. Roentgenologic examination showed a heart that, during deep inspiration, appeared to be suspended between the vascular pedicle above and the inferior vena cava below. If the electrocardiograms discussed by Evans and Lloyd-Thomas were normal and associated with a peculiar stance of the heart within the thorax, it might be expected that the changes might be found even in children, as was the case in 1 of the 3

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

patients presented. The true incidence of this syndrome in a population cannot be known without mass surveys, but recognition of the benign nature of the electrocardiographic findings is important for the sake of reassurance of the patient and for the question of insurance. Case 2 indicates that the degree of electrocardiographic "abnormality" may be considerable.

Brucellosis and Heart Disease: III. Chronic Valvular Heart Disease Following Nonfatal Brucellosis. T. M. Peery and J. M. Evans. Ann. Int. Med. 49:568-579 (Sept.) 1958 [Lancaster, Pa.]

Having noted the frequency and chronic nature of endocarditis of the aortic valve in patients with fatal brucellosis, the authors searched for evidence that similar lesions may occur in patients who survive their infection. They report on 5 men and 5 women in whom a clinical diagnosis of brucellosis was made at the average age of 40.7 years and a diagnosis of heart disease was established at the average age of 51.5 years. In some of the 10 patients the diagnosis of brucellosis was based on serologic data; in others the evidence was circumstantial; in none was there a record of positive culture of Brucella organisms. By investigating those presenting with evidence of calcific aortic stenosis, 4 of the 10 patients were detected in whom an infection diagnosed as brucellosis preceded the recognition of valvular heart disease. Conversely, by studying those in whom a diagnosis of brucellosis had been made previously, chronic valvular heart disease was uncovered in the remaining 6 patients. The aortic valve was affected in 9 of these 10 patients. Six patients died at the average age of 59.5 years, and the remaining 4 are believed to be alive. The cases of these patients show that endocarditis due to brucellosis is not necessarily fatal during the phase of active infection, but has a natural tendency to heal. They provide the missing link in the chain of evidence which connects brucellar endocarditis with calcific aortic stenosis.

Treatment of Tuberculosis of Cervical Lymph Nodes. P. C. Schmid. München. med. Wchnschr. 100:1279-1285 (Aug. 29) 1958 (In German) [Munich].

Selection of the proper treatment in patients with tuberculosis of the cervical lymph nodes depends on differentiation between the primary lymphogenous and the secondary hematogenous form of the disease. Treatment by the conservative method may be effective only in the early stage of the disease in the absence of caseation, or with slight caseation. Fistulas will form sooner or later in nodes with lymphomas, a size larger than a cherry, in which caseous necrosis has occurred. Lymph nodes, in which the tuberculous process may have reached a quiescent stage as the result of copious calcium deposits, may again become active and progressive, even after many years. In patients with this type of lesions, the radical removal of the infected lymph nodes, combined with prophylactic administration of antibiotics, preoperative treatment with antiphlogistic and antibacterial agents, and postoperative treatment with tuberculostatic drugs, is the method of choice. The treatment of patients with secondary hematogenous tuberculosis of the cervical lymph nodes depends on the underlying disease, which is usually localized in the lung, and therapy generally consists of the administration of chemobiotic agents. Tonsillectomy is indicated only in patients in whom the tonsils have been altered by chronic inflammation. Tonsillectomy should be carried out before the removal of the lymph nodes in patients with simple lymphomas, and it should be performed after the removal in patients with lymph nodes which are no longer firm and in which abscess formation has occurred. Roentgenotherapy should be considered merely as a complementary measure to reduce perifocal inflammation in small and simple lymphomas, and to prepare the patient for surgical treatment. Many workers believe that roentgenotherapy has become unnecessary since the advent of chemobiotic therapy.

Emphysema and the Lungs of the Aged: A Clinical Study: Preliminary Report. E. Mayer, C. Blazsik and I. Rappaport. Dis. Chest 34:247-256 (Sept.) 1958 [Chicago].

This study is an analysis of the prevalence and the distinguishing features of emphysema in the aged. It is in progress at the Frances Schervier Home and Hospital in New York. Of 420 men and women residents, the majority (88%) are admitted to the home in so-called normal health for their age. A minority (12%) are admitted as patients to the hospital division. Eighteen patients with pulmonary emphysema were found, of whom all but 3 were men, emphysema being predominantly a disease of men regardless of age. In contrast to this, women showed a tendency toward changes in the lungs and chest due to aging, namely, "senile lung," which, however, is not a clinical entity. Older persons with so-called senile lungs have practically no symptoms or signs of pulmonary disease. Their lungs are quite efficient within the increasingly restricted range of activity which naturally goes with progressive aging. In the series studied the diagnosis of senile lung was made only in the absence of symptoms and signs pertaining to obstructed breathing and hyperinflated lungs. Preliminary study of emphysema in the aged gave support to the validity of the concept of senile lung versus senile emphysema. Aging is associated with changes which result in the senile lung. These changes became clinically demonstrable mostly after age 80 and predominantly in women. Among older persons who had led a life of vigorous activity, especially men, senile lung changes were delayed or absent. Atrophy through disuse probably plays a role in the changes of the senile lung.

The term "senile emphysema," appears to be a misnomer. Emphysema presents the same features in the aged as in the young. In older emphysematous persons, the clinical signs and symptoms of obstructive breathing are present, and the thorax is overdistended. In the truly senile state, the chest and lungs show loss of structure and contraction in volume, but the functions appear sufficient for older persons with reduced activities. Senile lung changes may predispose to a late and rapid onset of emphysema under such pathological conditions as congestive failure or bronchopulmonary infections, which tend to increase the functional burden upon the heart and lungs.

Subacute Hepatic Necrosis and Postnecrotic Cirrhosis Due to Anicteric Infections with the Hepatitis Virus. G. Klatskin. Am. J. Med. 25:333-358 (Sept.) 1958 [New York].

The author reports on 8 women, between the ages of 42 and 66 years, and 1 34-year-old man who were selected from a group of 69 patients with subacute hepatic necrosis and/or postnecrotic cirrhosis and in whom the disease appeared to have its inception in an attack of anicteric viral hepatitis. Biopsy specimens were obtained from each of the 9 patients sufficiently early in the course of the disease to show the characteristic histological features of viral hepatitis. With one exception, all the patients were middle-aged or elderly women. Characteristically, the onset of the disease was relatively abrupt, with nonspecific constitutional and gastrointestinal complaints, but was followed within a period ranging from 2 to 18 months by the appearance of frank signs of chronic liver disease. Jaundice occurred late in 8 of the 9 patients, becoming evident within 3 to 55 months from the onset. Often it was accompanied by dark urine, light stools, pruritus, and markedly elevated serum alkaline phosphatase level, features that frequently were misinterpreted as evidence of extrahepatic biliary obstruction. In addition to the elevated serum alkaline phosphatase level, marked serum globulin concentration and high levels of thymol turbidity were helpful diagnostic clues. The disease tended to run an intermittently progressive course that was little affected by dietary measures and rest in bed and that terminated fatally in 5 of the 9 patients.

Women predominated not only among these patients but also among those with an acute or insidious onset of the disease without jaundice whose cases were reported by other workers; it shows that females at all ages are peculiarly susceptible to the anicteric form of viral hepatitis that produces subacute hepatic necrosis and postnecrotic cirrhosis. Anicteric infections by the hepatitis virus, which are readily overlooked or misinterpreted, may be responsible for many cases of otherwise unexplained cirrhosis and particularly those of the classic postnecrotic variety that occur in women.

Needle Biopsy of the Liver: Comparison of Initial Clinical and Histological Diagnoses, with a Note on Postbiopsy Mortality in Patients with Metastatic Neoplasm. C. J. Fisher and W. W. Faloon. Am. J. Med. 25:368-373 (Sept.) 1958 [New York].

The authors report on 341 patients on whom 408 needle biopsies of the liver were performed between 1950 and 1957. The results of the biopsy were of positive diagnostic significance in 226 patients, and in the remaining 115 they were either normal or revealed nonspecific changes. The initial clinical diagnosis was proved correct in 201 patients. In 26 patients, the biopsy revealed fatty metamorphosis when the clinical impression was that of cirrhosis; in these patients the clinical diagnosis cannot be considered to be in gross error. However, in the remaining 114 patients (33.4%) the clinical impression was subsequently changed by the biopsy. In 12 patients extrahepatic biliary obstruction was suspected clinically but was not confirmed on biopsy. In an additional 8 patients biopsy revealed extrahepatic obstruction which was not suspected clinically. In these patients the biopsy was of great aid in determining the need for surgery. In 30 patients metastatic carcinoma was clinically diagnosed but not found at biopsy, while in 14 patients biopsy revealed metastatic carcinoma which was not clinically suspected; thus, in 44 patients the prognosis was altered due to the fact that an unsuspected malignancy was found or that an expected malignancy was not found. In the remaining 50 patients neither the therapy nor the prognosis was greatly altered by the biopsy findings, although the histological interpretation was not the same as the clinical diagnosis. The histological diagnosis as established by needle biopsy was proved by laparotomy or autopsy to be erroneous in 8 patients. Errors in diagnosis probably occurred in 3 additional patients as revealed by the cytological study of ascitic fluid and sputum.

Biopsies were not performed on patients with a known hemorrhagic disorder or severe anemia. Despite these precautions death occurred in association with hemorrhage in 5 patients, representing a mortality rate of 1.5%. Four of these patients had metastatic carcinoma of the liver, which was found in biopsy specimens. These 4 patients belonged to a group of 33 patients with metastatic carcinoma who underwent biopsy. Thus, the mortality rate in the presence of metastatic carcinoma was 12%. These data suggest that percutaneous needle biopsy is potentially dangerous in patients with suspected malignant disease of the liver. Surgical biopsy with the aid of local anesthesia in such patients may be a preferable procedure, having the advantages of adequate visualization of the liver and thereby reducing the number of false-negative results as well as decreasing the incidence of uncontrolled hemorrhage.

Alcohol Sensitivity in Hodgkin's Disease (Report of Two Cases). D. N. Tweeddale, J. B. Whelan and F. L. Browning. Ohio M. J. 54:1165-1167 (Sept.) 1958 [Columbus].

A 50-year-old woman first noticed enlarged right cervical lymph nodes in September, 1954. These were painless and seemed at times to disappear. In August, 1955, she had an acute flare-up of inflammatory rheumatism, which subsided under treatment. After this, the enlarged cervical nodes became barely palpable. She was seen again in February, 1956, with a right-sided lobar pneumonia. At this time the cervical nodes were again enlarged, but after recovery from the pneumonia they decreased in size. Four months later, when the cervical nodes became enlarged again, biopsy revealed a proliferative, inflammatory, glandular hyperplasia. The patient began to lose weight, became short of breath on the least exertion, had dizzy spells and a very rapid pulse, and had no appetite or pep. At this time she noticed that, whenever she imbibed alcohol, there occurred pain in the back that radiated into the abdomen. It was so severe that she voluntarily abstained from alcohol. The pain commenced about 5 or 10 minutes after alcohol ingestion. It started as a dull ache in the lower part of the back and increased in intensity until it girdled the abdomen. This lasted about 1 or 2 hours and then gradually diminished. About one week before the patient was admitted to the hospital, she experienced the same reaction after a second dram dose of elixir of butabarbital (Butisol) sodium. She was rehospitalized in January, 1958, and a diagnosis of Hodgkin's paragranuloma was rendered. She was then given a course of deep x-ray therapy to cervical and retroperitoneal lymph nodes, after which all enlarged and palpable nodes practically disappeared. About 10 days after therapy she was encouraged to try a martini, which she did, with none of the aforementioned symptoms.

The second patient presented was a 27-year-old woman, who consulted her physician because of difficulty in swallowing, pain under the left shoulder blade after the ingestion of alcohol, and enlargement of the neck. Her symptoms had been present for 3 months. She stated that severe, sharp pain beneath the scapula commenced about 10 minutes after alcohol ingestion and lasted for 2 or 3 hours. Biopsy of one of the nodes revealed a typical Hodgkin's granuloma.

The authors briefly review the literature on alcohol sensitivity in Hodgkin's disease, pointing out that the commonest manifestation of alcohol-induced sensitivity in Hodgkin's disease is pain; however, generalized pruritus, cough, a sense of suffocation or oppression in the chest, increase in size of nodes and fever, and a generalized feeling of ill health have also been noted. The importance of further investigation of a patient who develops pain after alcohol consumption is stressed. The syndrome may be the earliest clinical manifestation of Hodgkin's disease. The possible value of alcohol sensitivity as a guide to therapy should be considered.

Simultaneous Occurrence of Moderate Hemophilia and Thrombopathy in One Family. S. Van Creveld, C. Everts-Coster and H. A. Veder. Nederl. tijdschr. geneesk. 102:1493-1496 (Aug. 2) 1958 (In Dutch) [Amsterdam].

The authors studied a family in which a form of moderate hemophilia occurred. With regard to the hereditary transmission, of the disease, however, this form differed from that of classical hemophilia. When a man from this family married a woman from a family in which some of the members had constitutional thrombopathy, the result was a sibship with the characteristics of both these hemorrhagic disorders.

Long-Term Use of Prednisone (Meticorten) in Generalized Cases of Lupus Erythematosus, Scleroderma and Neurodermatitis Disseminata. B. Kanee and J. Mallek. Canad. M. A. J. 79:468-472 (Sept. 15) 1958 [Toronto].

Since March, 1955, the authors had the opportunity for a close clinical and laboratory study of prednisone (Meticorten) in 3 disabling dermatomedical conditions. The purpose of their study was to determine: (1) the feasibility and efficacy of long-term therapy with prednisone in the following chronic diseases, lupus erythematosus disseminatus (systemic), generalized scleroderma (systemic), and generalized neurodermatitis disseminata (atopic eczema); and (2) the risks involved in such long-term therapy. The histories of 3 patients are presented; these patients have been on continuous maintenance therapy with prednisone, in dosages varying from 10 to 40 mg. daily, for a period of 2½ years.

It was found that long-term therapy with prednisone is feasible and justifiable in the aforementioned seriously disabling diseases. One of the major risks of long-term steroid therapy is a lowering of resistance to bacterial infections, particularly Staphylococcus pyogenes var. aureus. When acute infection supervenes, it is important to increase the dosage of corticosteroids immediately and to cover with specific antibiotics. Corticotropin (ACTH) should not be substituted during times of increased stress. One patient with systemic lupus erythematosus disseminatus on long-term prednisone therapy is showing a weight loss which may be due to a catabolic effect of the hormone. No disturbance of serum electrolytes, blood sugar, cholesterol, nonprotein nitrogen, or blood pressure has followed the long-term prednisone therapy in the dosage used.

Amyloidosis and Collagen Disease. G. Teilum. Nord. med. 60:1137-1141 (Aug. 7) 1958 (In Danish) [Stockholm].

The morphologic and clinical relationships among amyloidosis, paramyloidosis, and the collagen diseases are discussed. The diseases designated as collagen diseases are, in addition to chronic polyarthritis and rheumatic fever, 5 less frequent diseases: lupus erythematosus disseminatus, periarteritis nodosa, dermatomyositis, generalized scleroderma, and thrombotic thrombocytopenic purpura, to which paramyloidosis is now added. Common clinical-pathological features have often been found in different types of collagen disease; variants and subtypes have been described. There is no wholly clear limitation between the concept "collagen disease" and other mesenchymal diseases, as, for example, Wegener's allergic granulomatosis and allergic angiitis. Other mesenchymal diseases, mainly or exclusively localized to the reticuloendothelial system, though not usually included in the collagen disease group, will show features in common with these. Amyloid development is a direct result of a dysfunctional phase in the protein synthesis of mesenchymal cells, presumably related to disturbance in some enzyme system. Substances such as cortisone, corticotropin, and mustard gas in experimental biopsy studies on changes in the spleen, were found to promote amyloid development in the course of a few days.

SURGERY

Glioblastoma Multiforme: Review of 219 Cases with Regard to Natural History, Pathology, Diagnostic Methods, and Treatment. S. A. Frankel and W. J. German. J. Neurosurg. 15:489-503 (Sept.) 1958 [Springfield, Ill.].

The authors report on 127 male (58%) and 92 female patients (42%), between the ages of 12 and 73 years, with glioblastoma multiforme who were admitted to the New Haven (Conn.) Hospital between 1924 and 1952. An abrupt onset, simulating a vascular accident, occurred in 8 of the 219 patients; in 2 the mode of onset was unknown; and in 209 it was gradual. Headache was the leading symptom in all 3 groups; about 33% of the patients had seizures, and in half of these it was the initial complaint. The duration of symptoms before the diagnosis was made was less than 6 months in 70% of the patients, but histories longer than 1 year were elicited in 17%. The total duration of the disease was less than 1 year in 67%; 11% of the patients lived 2 to 5 years. The duration of the disease was not related to the age or sex of the patient. There was no evidence of familial incidence or of a relationship with any other disease of the nervous system.

The cerebrospinal fluid was almost always abnormal in some respect. Lumbar puncture was done for diagnostic purposes in 122 of the 219 patients; the deaths of 2 patients were directly attributable to this procedure, while the information gained was nonspecific. Routine use of lumbar puncture is not recommended. Roentgenograms of the skull revealed various abnormalities in 59% of the patients. Electroencephalographic findings were abnormal in 93% of the patients; they made possible correct localization of the lesion in 49%. Pneumoencephalograms were obtained from only 19 patients, and the procedure caused the death of 1 patient; the lesion was localized with the aid of this procedure in only 3 patients. Ventriculograms yielded a correct localization of the lesion in 104 (77%) of 135 patients. Arteriography was performed on only 21 patients, with correct localization of the lesion in 10 (48%).

Of the 219 patients, 183 underwent surgical treatment, with an operative mortality of 18.5%. Average postoperative survival time was about 3 months. The more radical surgical procedures, including "total" removal of the tumor (complete removal of all visible tumor tissue) and lobectomy, offered the best prognosis with regard to operative mortality and survival time. Of 47 patients receiving roentgenotherapy, 21 were given a course of 2,700 to 5,900 r tumor dose, which was completed within 60 days after the surgical intervention. The percentage of survivors in this group of patients was considerably higher as compared with that in the group of patients who underwent surgery alone. The effect of all present types of treatment is to prolong the patient's life by 3 to 6 months. Long-term survivals were just as common among untreated patients as among those treated. Postoperative disability tended to be great; only 40% of the patients had slight or no disability. Sixty per cent of the patients did not obtain remission of their symptoms. Only 15% of the patients went 6 months without a recurrence. There were no cures.

Pathological examination of the surgical specimens or autopsy findings revealed a mixed picture, with no single type of cell predominating in 174 patients. The fibrillary astrocyte was the predominant cell in 15 patients, the protoplasmic astrocyte in 7, the spongioblast in 6, and the astroblast in 1. In the remaining patients the predominant cell type was not recorded. Comparison of the total duration of illness in a group of 142 patients with tumors having numerous mitotic figures with that in a group of 54 patients with tumors having rare or no mitotic figures showed almost identical survival curves for both groups; thus, the number of mitotic figures seems to bear no relationship to prognosis.

Hypophysectomy in Severe Diabetes: I. Neurosurgical Aspects. M. Javid, E. S. Gordon and T. C. Erickson. J. Neurosurg. 15:504-511 (Sept.) 1958 [Springfield, Ill.].

The authors report on 11 men and 4 women, between the ages of 19 and 61 years, with severe diabetic complications of the Kimmelstiel-Wilson type who were operated on in the department of neurosurgery of the University Hospitals in Madison, Wis., between 1954 and 1957. The duration of known diabetes mellitus in these patients varied from 9 to 29 years. These patients had severe loss of vision and varying degrees of nephropathy. Neurosurgical procedures in 10 patients consisted of a complete surgical hypophysectomy and in the remaining 5, of section of the pituitary stalk. A subfrontal approach by means of a "2-in." craniotomy on the side of the blind eye was employed in all patients. The cerebrospinal fluid was drained before opening the dura mater by a T-shaped incision, the horizontal limb of the T being placed at the center of the "2-in." trephine opening with the vertical limb at the direction of the roof of the orbit. This was found satisfactory to protect the brain, which is of great importance in these diabetic patients. The hypophysectomy was performed according to Olivecrona and Ray's techniques. Section of the pituitary stalk was performed by dividing the stalk between 2 tantalum clips immediately above the diaphragma sellae, and a piece of polyethylene film was placed over the distal end. Endotracheal anesthesia was used in all the patients.

There was a consistent and marked decrease in insulin requirement postoperatively. Average blood pressure readings were all lower than preoperatively except in one patient. There was consistent improvement in the diabetic retinopathy and return of vision in some patients. Three patients died within 2 to 8 days after the surgical intervention, and 5 patients died after discharge from the hospital within 3 to 26 months after hypophysectomy. Five of the 8 deaths resulted from severe, prolonged hypoglycemia. Of the remaining 3 patients who died, severe diabetic nephropathy and cerebral edema caused the death of the first patient, severe coronary sclerosis, pulmonary edema, and hypertensive encephalopathy were responsible for the death of the second, and bronchopneumonia and purulent tracheobronchitis were the chief causes of death in the third. Autopsy performed on 2 patients who died after section of the hypophysial stalk revealed very extensive necrosis of the anterior pituitary in one patient and only a small area of necrosis in the other. These findings may account for the observation that improvement in vision and alteration in endocrine assays in the patients who underwent section of the pituitary stalk were not parallel to the improvement observed in the patients who underwent hypophysectomy. Section of the hypophysial stalk does not appear to be the physiological equivalent of total hypophysectomy, both from the standpoint of practical therapeutic results and from physiological studies.

Hypophysectomy is not indicated as a routine therapeutic method in patients with advanced juvenile diabetes mellitus, but further studies and reevaluation are indicated. Major renal insufficiency is a contraindication to surgical treatment which should not be performed on patients who will not follow instructions concerning insulin administration and diet postoperatively. Teamwork between neurosurgeon and endocrinologist as well as careful follow-up are essential. Hypophysectomy transforms a severe diabetic condition to a mild one as far as insulin requirement is concerned, but it does not reverse permanent vascular changes that have already occurred. The results obtained in some of the surviving patients, however, have been sufficiently impressive to consider hypophysectomy as having a place in the management of selected patients with severe diabetes and intercapillary glomerulosclerosis (Kimmelstiel-Wilson's disease).

Destruction of the Hypophysis with Radioactive Colloidal Chromic Phosphate in Cancer of the Prostate. P. C. Johnson, K. M. West and B. J. Rutledge. J. Neurosurg. 15:519-527 (Sept.) 1958 [Springfield, Ill.].

The authors treated 6 men, between the ages of 59 and 66 years, with biopsy-proved carcinoma of the prostate by direct injection of radiophosphorus (P^{32}) as colloidal chromic phosphate into the hypophysis. The pituitary stalks were clipped and severed before the injection of P^{32} in 3 of the 6 patients. Five patients had undergone previous orchiectomy, with symptomatic improvement resulting in 4. All the patients required administration of narcotics for relief of pain, and each patient had become refractory to estrogen therapy before destruction of the pituitary was attempted. Three of the 6 patients died within 32 hours to 5 days after the operation. The other 3 patients survived the operation for periods ranging from 10 weeks to 1 year. The 3 survivors noted relief of pain in bones. One of these 3 showed objective evidence of remission of tumor growth. Panhypopituitarism was present in 2 of the 3 patients. In one patient this persisted until his death 10 weeks after the surgical intervention. In the other patient the hypopituitarism and diabetes insipidus produced by the procedure disappeared 6 months after surgery.

Autopsies were done on 5 patients. Of the 3 in whom the pituitary stalk had not been divided before the injection of P^{32}, 2 showed minimal histological changes in the hypophysis. In the 2 patients in whom the stalk was divided, the hypophysis was completely destroyed. These findings would suggest that division of the stalk combined with irradiation may result in more complete destruction of the pituitary body than does irradiation alone. The finding of considerable amount of P^{32} in both the spinal fluid and the blood as early as the first day after the intrapituitary injection showed that the injected material disappeared rapidly from the hypophysis. Destruction of the pituitary by irradiation is yet to be proved superior to surgical hypophysectomy.

Pulmonary Cancer Without Roentgen Findings. J. L. Hansen. Ugesk. læger 120:1037-1044 (Aug. 7) 1958 (In Danish) [Copenhagen].

In a series of 343 consecutive cases of bronchial carcinoma, there were 42 in which roentgenography showed nothing pathological. In these cases the apportionment according to sex, age, and histological type agreed with that in the total material; the history was relatively long. The symptoms were most often typically bronchial. Bronchoscopy is urged in cases with suspect bronchial symptoms of more than a few weeks' duration, also when roentgen-ray examination shows normal conditions. Repeated prescription of cough medicine without careful clinical observation is not advised. The symptoms which should awaken suspicion of bronchial cancer (also in cases with normal roentgen-ray picture) are cough or change in the usual cough, expectoration, strident respiration, together with dyspnea, and pain in the thorax. Bronchoscopy gives a positive diagnosis about equally often in early and late cases of bronchial cancer and is equally indispensable in excluding and in establishing the diagnosis of bronchial cancer. Normal roentgen-ray picture in 2 planes and normal bronchoscopy will with considerable certainty exclude the possibility of bronchial cancer.

Operative Treatment of Pulmonary Metastases and of Pulmonary Processes with Suspected Metastases. J. L. Hansen. Ugesk. læger 120:1045-1052 (Aug. 7) 1958 (In Danish) [Copenhagen].

Thirty cases of pulmonary metastases in 18 men and 12 women, mostly between 50 and 69 years of age, were analyzed. In 7 cases pulmonary resection was done, with 8 operations, as one patient was operated on bilaterally. There were no postoperative complications or deaths. Six of the patients are living without signs of recurrence from 4 to 15 months after the operation. In the same period 7 other patients with suspected pulmonary metastases were operated on and were found to have other diseases. Solitary solid pulmonary processes should generally be treated operatively, even when there is history of malignant extrathoracal tumor, provided that the primary cancer has been treated radically and there is no evidence of other metastases. Roentgenologic examination of the lungs at regular intervals is proposed for patients who have been operated on, with apparent success, for extrathoracal malignant tumors.

Should We Insist on "Radical Pneumonectomy" as a Routine Procedure in the Treatment of Carcinoma of the Lung? J. Johnson, C. K. Kirby and W. S. Blakemore. J. Thoracic Surg. 36:309-315 (Sept.) 1958 [St. Louis].

The authors point out that Allison in 1950 proposed the term "radical pneumonectomy" to describe the removal of all possible mediastinal areolar tissue, containing the lymphatics, in continuity with the lung. According to Watson, whose motion picture on radical pneumonectomy has been widely circulated, the dissection starts at the apex of the mediastinum, and all areolar tissue and lymph nodes are reflected downward as the trachea, esophagus, and other important structures, as well as the contralateral bronchus, are partially "skeletonized." The pericardium is resected with the lung and mediastinal tissues after the pulmonary vessels have been divided intrapericardially. The film implied that anyone doing less than a radical pneumonectomy for cancer of the lung might not be doing everything possible to cure his patients. The authors, at the Hospital of the University of Pennsylvania, had been removing lymph nodes in the mediastinum immediately adjacent to the hilus, going over as far as the bifurcation of the trachea, but they had resected the more distant nodes only when there seemed to be involvement of those nodes, and, therefore, they found themselves on the defensive regarding the surgical treatment of pulmonary cancer.

The authors compared the 5-year survival rate they had obtained with their "standard" resection with the 5-year survival rate obtained by those who employed radical pneumonectomy. Of 764 patients with carcinoma of the lung at the Hospital of the University of Pennsylvania, 344 were seen more than 5 years ago. Of this group, 192 (56%) were explored and 116 (34%) were subjected to pulmonary resection. The operative mortality was 7.7%. Thirty-one patients (26.7% of those subjected to resection or 9% of the total number of patients) survived 5 years or more. Radical pneumonectomy was not employed in this series. The 5-year survival so far reported after radical pneumonectomy is not significantly higher than the authors obtained with the standard-type resection. They suggest that until it can be shown that radical pneumonectomy produces superior results, the thoracic surgeon is not obligated to perform the radical operation. However, they do not wish to discourage the resection of all grossly involved tumor tissue and feel that the surgeon should make a real effort to get around the locally invasive tumor whenever possible.

Studies to date indicate that blood vessel invasion as found in the surgical specimen is of greater prognostic significance than lymph node invasion. Whereas there was only a 6% 5-year survival among those patients showing blood vessel invasion in the tumor, there was a 75% 5-year survival when blood vessel invasion was not present. This may in part account for the fact that radical pneumonectomy to date has not produced the great improvement in the 5-year survival rate which was anticipated.

Further Studies in the Surgical Management of Carcinoma of the Lung: A Further Study of the Cases Treated at the Massachusetts General Hospital from 1950 to 1957. E. D. Churchill, R. H. Sweet, J. G. Scannell and E. W. Wilkins Jr. J. Thoracic Surg. 36:301-308 (Sept.) 1958 [St. Louis].

The previous report on the surgical management of primary carcinoma of the lung at the Massachusetts General Hospital in Boston included all patients seen in the years from 1930 to 1950, with follow-up data on all resections carried out prior to January, 1948. The present study brings up to date the results of surgical management of cancer of the lung at the same hospital by adding the cases of all patients seen in the period from January, 1950, to January, 1957, with follow-up information on all resections performed before January, 1956. Complete follow-up data are available on 341 resected cases. These data show that in the recent 7-year period a greater percentage of patients with proved carcinoma of the lung have come to operation than in the earlier series (55% compared with 43%). The resectability rate has also increased (35% of proved cases compared with 25%). The 5-year cumulative survival rate for all patients undergoing resection for cancer of the lung remains approximately 28%. The 10-year cumulative survival rate for such patients is 18%.

Results in the Treatment of Bronchogenic Carcinoma: An Analysis of 1,008 Cases. T. H. Burford, S. Center, T. B. Ferguson and H. J. Spjut. J. Thoracic Surg. 36:316-328 (Sept.) 1958 [St. Louis].

The senior author and his associates at the Barnes Hospital in St. Louis observed 1,008 patients with primary bronchogenic carcinoma of the lung between 1948 and 1955, inclusive. The diagnosis was verified in 100% of the cases by microscopic section, the material being obtained by bronchoscopic biopsy, cytological study of the sputum, biopsy of metastatic implants, needle biopsy, frozen-section biopsy at the time of thoracotomy, and examination of the resected specimens. The minimum follow-up period was 1½ years and the maximum, 9½ years. The distribution as to sex, age, cell type, and site of origin did not differ significantly from that of other reported series. Surgical exploration was carried out in 60% of the patients; resection was possible in 35%. Pneumonectomy comprised 80% of the resections; lobectomy, 20%. The percentage of lobectomy cases increased from 3% in 1948 to 30% in 1955. The over-all operative mortality was 11%.

The 5-year survival rate for all patients who were followed an adequate length of time was 9%. In the selected group in whom surgical resection was possible, the 5-year survival rate was 22%. Study of the resected specimens from the 5-year survivors revealed epidermoid carcinoma to be the most prevalent cell type (77.5%), but a surprisingly high number of undifferentiated tumors (12.5%) were present. Almost half (45%) of the specimens showed lymph node involvement, and 8% had blood vessel invasion. Surgical resection could be done in only 1 of each 3 cases diagnosed. This ratio remained unchanged throughout the 8-year span. Significant increase in 5-year survivals will be possible only through an increase in the percentage of resections performed.

Clinical and Experimental Observations on 1627 Cases of Cancer of the Breast (Continuation and Conclusion). J. Lavigne. Acta chir. belg. 57:215-231 (March) 1958 (In French) [Brussels].

This concluding chapter in a study of 1,627 cases of breast cancer, with a follow-up of at least 5 years, is devoted to the problem of recurrences, with special reference to their possible causes. A 10-year follow-up period was considered appropriate for this part of the work, because, while recurrences have been reported after periods of more than 10 years—even 15 or 20 in some cases—it is quite possible that these very late recurrences really represent either second cancers or the reactivation of an overlooked islet of the original tumor. Patients followed for less than 10 years were therefore excluded from consideration, as were 89 others —30, because they did not receive standard treatment, i. e., a radical operation, either alone or followed by roentgenotherapy; 4, because they were lost sight of before the end of the 10th year; and 55, because they died of intercurrent diseases. Almost four-fifths of the remaining 859 patients (682, or 79.3%) had one or more recurrences during the 10 years they were under observation, while the other one-fifth (177) were still living at the end of 10 years without ever having had a recurrence.

Statistical analysis of the findings in the 682 patients with recurrences showed that there was no connection between the age of the patients and the appearance of the recurrent lesions. This fact, which is in harmony with the findings obtained in the earlier part of this study, warrants the conclusion that the primary tumor and its possible recurrences behave in exactly the same way. Most (85%) of the recurrences appeared in the first 5 years, and after the 8th year the percentage of recurrences became negligible. Correlation of the number of recurrences with the stage of the cancer at the start showed that 86% of the stage 3 and stage 4 tumors recurred during the first year, as against only 49% of the stage 1 tumors. The findings in these patients failed to show any relation between the average survival periods and the time at which the first recurrence became clinically apparent. It must be remembered, however, that the number of patients in certain categories, e. g., those with recurrences in later years, was small and that the exact time of appearance of a recurrence cannot always be precisely determined.

Recurrences were less frequent in patients treated with combined surgery and x-ray therapy than in patients treated with surgery alone. The type of treatment given, whether surgery alone or surgery combined with x-rays, on the other hand, had no effect on the date and rate of appearance of recurrences, the frequency of metastases and generalization, or the length of the survival period.

A separate study of 24 patients in whom recurrences took place more than 10 years after the initial treatment of the original tumor was noteworthy, first, for the small number of patients so affected, and, second, for the much greater length of the average survival period, which was 42 months in these patients, as compared with 18 to 21 months in those in whom recurrences appeared earlier. Various modern studies on the latency of cancer cells seem to show that these late recurrences are due to the effect of some unknown factor—either a direct chemical agent or a vascular modifier—which gives latent cancer cells increased mitotic power.

PEDIATRICS

Congenital Hernia of the Diaphragm in Newborn Infants. R. Neimeier. Ann. paediat. 191:87-94 (Aug.) 1958 (In German) [Basel, Switzerland].

In the course of 5 months, 4 newborn infants with congenital diaphragmatic hernia were observed in the Woman's Clinic of the University of Basel. The author believes that this high incidence was accidental, as only 28 infants with fatal congenital diaphragmatic hernia had been observed over a period of 50 years among 103,786 births. The course was similar in all 4 infants. They appeared viable and emitted 1 or 2 weak cries. After the cutting of the cord, however, increasing dyspnea rapidly led to cyanosis. The action of the auxiliary respiratory musculature increased again, as did also the pulse and respiratory frequencies, but the respiratory excursions of the involved side of the thorax were diminished, and auscultation revealed no respiratory sounds on this side. The latter sounds may eventually be displaced by intestinal peristaltic sounds.

Circulatory stimulants were ineffective in these cases. The administration of oxygen produced only temporary improvement and was incapable of preventing the increasing dyspnea and death, which in the 4 infants occurred within 40 to 125 minutes. In 3 of the infants mediastinal displacement had the effect that the heart beat was audible on the right side of the thorax. A roentgenologic survey examination, which in 2 of the infants was done only after death, corroborated the diagnosis. It revealed gas-filled intestinal loops in the involved side of the thorax and displacement of the mediastinum and trachea; in some cases, shadows of abdominal organs (liver) protruded into the thorax. In 3 cases the diagnosis was further corroborated by roentgenography with the aid of barium as contrast medium. The congenital hernia of the diaphragm was associated with other congenital defects in 3 of the 4 infants. Operative repair of the diaphragmatic hernia would become possible only if the condition were recognized early.

Postpneumonic Pseudo Air Cysts in Children. K. Schlager. Fortschr. Geb. Röntgenstrahlen. 89: 136-146 (Aug.) 1958 (In German) [Stuttgart, Germany].

The formation of cyst-like hollow spaces in the course of or after pneumonia in children seems to have increased in incidence since the introduction of modern chemotherapeutic treatment, and particularly antibiotic therapy. The terminology of the condition is somewhat confused, since it has been reported under such diverse terms as tension vesicles, valvular cyst, localized or bullous emphysema, metapneumonic emphysema, pneumotoceles, pseudocavities, ring shadows due to resorption, acquired cysts, and obstructive emphysema. The author prefers the term "postpneumonic pseudocyst," because it not only differentiates the condition from congenital pulmonary cysts but also suggests the etiology and gives the impression of a thin-walled, aerated hollow space. These postpneumonic pseudocysts develop in the pulmonary parenchyma, chiefly in infants and young children, and are characterized by considerable variation in size and by the fact that they produce no symptoms and that they generally regress spontaneously without treatment.

There is as yet no complete agreement on the pathogenesis, but the majority of investigators are of the opinion that a hollow space develops in the peripheral lung tissue as the result of a valvular stenosis in a small bronchus or bronchiolus. Presumably the increase in pressure beyond the valve-like bronchostenosis causes dilatation of the alveoli or lobuli in the form of a functional emphysema, and the inflammatory changes in the surrounding parenchyma promote the tendency to expansion. On the other hand, it is possible that hollow spaces are formed as the result of poststenotic inflation of foci of gangrenous or suppurating breakdown. There is as yet no agreement as to whether the air inflation of the pseudocyst occurs during inspiration or expiration, the more so since exploratory puncture is inadvisable because of the danger of possible complications, such as tension pneumothorax, collapse, or infection. The author regards it as most likely that air enters the poststenotic part of the lung chiefly during forced expiration, that is, during coughing.

The following factors are characteristic for postpneumonic pseudocyst: roentgenologic or anamnestic evidence of pneumonia; circular or (when large) long oval shape of the outline; a thin wall; fluctuation in size, and well-being during enlargement; and regression without treatment. The differential diagnosis is difficult and must rule out pneumonia with abscess formation, partial and tension pneumothorax, bronchiectasis, congenital pulmonary cysts, diaphragmatic hernia, tuberculous cavities, and various other lesions that may cause ring-shaped shadows. Illustrating case histories are presented of 4 children who had postpneumonic pseudocysts. They ranged in age from 5 months to 3½ years.

Congenital Deaf-Mutism, Prolonged QT Interval, Syncopal Attacks and Sudden Death. S. A. Levine and C. R. Woodworth. New England J. Med. **259:** 412-417 (Aug. 28) 1958 [Boston].

The authors report a new and a very distinct clinical entity—congenital deaf-mutism associated with functional heart disease. A young boy showed the essential peculiarities that identify the condition, such as attacks of unconsciousness; peculiar electrocardiograms, consisting of marked prolongation of the QT interval, with large T waves; sudden, early death; and no other objective evidence of organic heart disease or any other disease (except for deaf-mutism) on physical or postmortem examination. The electrocardiograms in these cases (a family in which 4 members manifested these same unusual features has recently been reported) are peculiar and unique. They are not absolutely constant from month to month, though generally the characteristic features are present. The PR interval tends to be slightly shorter and does not vary even when the ventricular complex changes. The most striking feature is the long QT interval, with large and often bifurcated T waves which may be positive, negative, or biphasic. At times the T waves resemble those seen in hyperkalemia, and at other times the tracings suggest the possibility of a disturbance in calcium metabolism or hypoparathyroidism, in spite of the fact that all electrolyte studies in such cases have been normal. Although the duration of electric ventricular systole is markedly prolonged, mechanical systole is of normal duration. Another feature of the electrocardiograms is the variability of the form of the complexes and the fact that the tracings may spontaneously revert to normal.

In the case reported, the fainting attacks experienced by the patient seemed to be related only to emotional situations in which he was frightened or told to do something that vexed him. No microscopic or gross cause of death could be found at autopsy, and in the absence of adequate cause death was presumed to have occurred as a result of sudden cardiac arrest or ventricular fibrillation. Another peculiarity of this condition is that in the few cases that have been reported death has occurred in childhood, the 3 previous patients having died at the ages of 4, 5, and 9 years and the patient in this case at the age of 13 years.

Neuroblastomas and Nephroblastomas: Clinical Study with Personal Material. S. Nordøy. Tidsskr. norske lægefor. **78:**705-709 (Aug. 1) 1958 (In Norwegian) [Oslo].

The author studied the symptoms, the clinical and roentgenologic signs, and the therapeutic results in 35 children with malignant retroperitoneal tumors admitted to the children's clinic of the Rikshospital in Oslo from 1938 to 1955. The average age on admission was 2½ years. The average duration of symptoms before admission was 9 weeks. Eleven patients had clinical or roentgenologic signs of metastases on admission. Seventeen cases were thought suitable for surgical treatment, but complete excision proved possible in only 5 cases, all of Wilms's tumor. One patient has survived 14 years after nephrectomy without irradiation treatment and another, 3½ years after preoperative irradiation and nephrectomy; in 3 cases recurrence set in after 2 months, 1 year, and 2½ years respectively. The prognosis for malignant retroperitoneal tumors in children has heretofore been considered extremely unfavorable in spite of treatment. Because of the rapid growth of these tumors, their early spread, and the absence of early characteristic symptoms, diagnosis is often made too late for reasonable hope of successful treatment.

Nephroblastomas originate from renal tissue; neuroblastomas develop from the sympathetic nerve tissue in the adrenals and along the posterior part of the abdominal wall. Differential diagnosis between the two tumor forms is difficult and often impossible. On the least suggestion of malignant disease, examination by a pediatrician and/or a roentgenologist is indicated, with hospitalization as soon as possible for active treatment if the suspicion is verified. With regard to nephroblastomas, there is general agreement that complete excision of the primary tumor is necessary for survival and that postoperative roentgen-ray treatment is necessary for improvement of the prognosis. When there are disseminated metastases, treatment can be only palliative. In the case of neuroblastomas, partial removal of the primary tumor and energetic postoperative roentgen-ray treatment give a relatively high percentage of survival, even with simultaneous liver metastases and regional lymph node metastases. With disseminated skeletal metastases, treatment can never be other than palliative. Early complete excision is the foremost aim also in this tumor form. Recovery has been seen on roentgen-ray treatment alone.

Congenital Afibrinogenemia. S. van Creveld and Liem Khe Hoo. Maandschr. kindergeneesk. 26: 227-237 (July) 1958 (In Dutch) [Leiden, The Netherlands].

The development of hematoma after trauma or prolonged bleeding during tooth eruption are the chief manifestations of congenital afibrinogenemia, whereas nasal and gastrointestinal hemorrhages are rare, and petechiae are never observed. This last aspect is probably due to the fact that the function of the blood platelets is normal. Congenital hypofibrinogenemia or afibrinogenemia can be temporary or permanent. The permanent form has been ascribed to hereditary factors. The female infant, whose history is presented, was the first child of healthy parents who were not related and whose family histories were free from hemorrhagic diathesis. Subcutaneous bleeding on the occiput and the neck of the infant was observed 24 hours after birth. Blood transfusion through the umbilical vein arrested this hemorrhage, and the hematoma disappeared. Hemorrhage from the umbilicus on the 8th day necessitated suture of the umbilical wound. It was found that the process of blood coagulation was impaired, but the child was discharged from the hospital 30 days after birth and remained free from severe hemorrhages to the end of the first year of life, when a blow caused a hemorrhage on the dorsum of the foot.

At this time various methods of examination failed to detect fibrinogen in the infant's blood. The authors emphasize that in the blood of such a patient the antihemophilic factor is present in normal quantities notwithstanding the absence of fibrinogen. There exists, however, an increased instability of the antihemophilic factor in the blood and an increased prothrombin consumption. There also exists a relationship between the fibrinogen content of the plasma and the prothrombin time, determined according to Quick's method. Transfusions of blood, plasma, or fibrinogen are promptly effective against the hemorrhagic diathesis of afibrinogenemia, but the effect is temporary only.

Hypovitaminosis C and Osteomyelitis in Childhood. R. Della Casa. Riforma med. 72:788-791 (July 12) 1958 (In Italian) [Naples].

A comparative investigation designed to determine the possible etiological correlation between the state of hypovitaminosis C and osteomyelitis was undertaken among 60 hospitalized children, aged between several months and 11 years. They were divided into 2 equal groups. The children in one group had osteomyelitis and those in the other group had disorders of the respiratory tract associated with fever, most of which were of the bronchopulmonary type. Ascorbic acid blood values among the children with osteomyelitis were very low in 11 children (up to 0.6%), fair in 11 (up to 1.12%), average in 6 (up to 1.5%), and saturated in none. History of these patients revealed that they had not previously received vitamin C and that their diet had been poor. This study was made in 5 children during the first week of the disease, in 6 children during the second week of the disease, and in the remainder after more than 2 weeks of the disease.

Ascorbic acid blood levels in 30 children with disorders of the respiratory tract varied within the physiological limits; these levels were fair in 14 children (up to 1.10%), average in 15 (up to 1.60%), and saturated in 1 child (over 1.60%). Vascular fragility values were high among most of the children with osteomyelitis but were within normal limits among those with respiratory disorders. Skin infections due to common pyogenic micro-organisms were frequent among the children with osteomyelitis. Blood examination revealed the presence of the same strain of pyogenic micro-organisms in the skin infections as in the osteomyelitic foci in 12 children. The author believes that a state of primary hypovitaminosis C was present in children who had osteomyelitis.

Hormone Excretion in Precocious Puberty in Girls. R. D. Bulbrook, F. C. Greenwood and A. H. Snaith. Arch. Dis. Childhood 33:295-300 (Aug.) 1958 [London].

The authors made determinations of estrogen, 17-ketosteroid, and gonadotropin in the urine collected from 11 girls, between the ages of 7 months and nearly 11 years, with precocious or early puberty. The vaginal smears of these 11 girls were likewise examined. Determinations of estrogen in the urine collected from 15 normal girls, between the ages of 3 and 10 years, were also carried out. Nine of the 11 girls with precocious or early puberty were excreting amounts of estrogen above 1 mcg. per 24 hours. In 7 of these girls positive vaginal smears were correlated with the finding of estrogen in the urine, and in 2 girls negative vaginal smears were correlated with the absence of estrogen in the urine. In one patient a negative smear was obtained in conjunction with 1.8 mcg. of estriol in the urine, while in another patient a positive vaginal smear was obtained but no estrogen was detected in the urine. The 17-ketosteroid excretion in 24-hour urine specimens varied from 0.7 to 2.5 mcg. as contratested with 0.47 ± 0.16 to 2.3 ± 0.85 mcg. in the specimens obtained from the normal girls. Of the 15 normal girls, estrogen was detected in the urine of only a 7-year-old girl who excreted 2.9 mcg. per 24 hours. Among other girls over 11 years of age who had breast development and pubic hair, but who had not menstruated, measurable amounts of estrogen varying from 2.9 to 7.1 mcg. were found in 24-hour specimens of urine.

While the 17-ketosteroid levels in the urine of girls with precocious or early puberty have been at the upper range of normal values and the estrogen levels have been above contratest levels, the results of these estimations are not diagnostic of precocious puberty, since completely normal values are not incompatible with the diagnosis. However, the obtained results are of value in distinguishing true precocious puberty from precocity due to pathological conditions, involving the gonads or the adrenals, and from nonhormonal vulval bleeding.

Exchange Transfusion for Acute Poisoning in Children. O. C. Bruton. U. S. Armed Forces M. J. 9:1128-1131 (Aug.) 1958 [Washington, D. C.].

Because dialysis of almost any nature is technically difficult and not available to most hospitals, exchange transfusion has been found to be effective and without undue hazard in the newborn period to prevent or remove dangerous amounts of circulating indirect bilirubin. Exchange transfusion may also be employed to remove dangerous amounts of other circulating substances, such as poisons, encountered in older children. Three among 142 children admitted to Tripler Army Hospital in Honolulu, T. H., were treated with exchange transfusion after ingestion and poisoning with large amounts of either Nembutal (brand of pentobarbital sodium), Pyridium (brand of phenylazo-diamino-pyridine hydrochloride), or aspirin. No deaths occurred. Exchange transfusion in selected cases of acute poisoning is effective and without hazard, but it must be started as soon as possible after evaluation of the patient and the circumstances surrounding ingestion of the poison.

Accidents in Childhood: A Survey of 150 Cases in Private Paediatric Practice. R. S. Fowler. Canad. M. A. J. 79:241-246 (Aug. 15) 1958 [Toronto].

The author reports on 138 children, seen in his private practice, who had 150 accidents about which he was consulted. Of the 138 children, 129 had 1 accident each, 6 had 2 accidents, and 3 had 3 accidents. Ninety-one accidents (61%) occurred among boys, and 59 (39%) among girls. Boys over 3 years of age were about 2½ times more frequently involved in accidents than girls. One hundred three accidents occurred among children of preschoo age, and 47 accidents among those between the ages of 6 and 13 years. Eighty-two accidents occurred inside the home and 13 in the adjacent yard as compared with 55 which occurred outside these premises. Of the 150 accidents, 105 (70%) were du to physical trauma, 22 (15%) to foreign bodies and material, 17 (11%) to poisoning, and 6 (4%) to burns Falls were the main cause of physical trauma, with falls from a height usually occurring among younger children and falls on the level among olde children. Foreign bodies seldom had serious consequences, but the ingestion of them seemed to b a manifestation of the same urges that cause children to ingest chemicals or drugs. These finding emphasize the principle that infants must be completely protected from hazards and that older children must be taught good safety habits.

UROLOGY

The Urinary Excretion of Calcium and Inorganic Phosphate in 344 Patients with Calcium Stone of Renal Origin. A. Hodgkinson and L. N. Pyrah. Brit. J. Surg. 46:10-18 (July) 1958 [Bristol, England].

The authors studied the urinary excretion of calcium and inorganic phosphate in 220 men and 124 women with calcium stone of renal origin, who were seen at the General Infirmary in Leeds, England, and in 132 normal men and 126 normal women. It is permissible to compare the distribution of urine calcium and inorganic phosphate values for normal adults with the distribution for a group of adult patients with stone, since the effect of normal variations in the intake of calcium and phosphorus on the excretion of calcium and inorganic phosphate in the urine is small compared with the effect of physiological variations among individuals. The normal range for the urinary excretion of calcium by adults on normal diet was found to be about 100 to 300 mg. per day for men and 100 to 250 mg. per day for women. The corresponding ranges for the urinary excretion of inorganic phosphate were 500 to 1,500 mg. per day for men and 500 to 900 mg. per day for women. The urinary excretion of inorganic phosphate by patients with stone did not differ appreciably from that of normal persons, but the urinary excretion of calcium was depressed, and there was appreciable impairment of renal function. It was found that about 11% of the 344 patients with stone had evidence of poor renal function. After omitting these patients, it was found that 59% of the remaining patients had average urine calcium values greater than 200 mg. per day, as compared with 26% of the normal adults.

The incidence of high urine calcium values was greater in normal men than in normal women. In patients with stone, the incidence of stone and of high urine calcium values was greater in men than in women. The incidence of high urine calcium values in patients with a history of recumbency at some time in the past, a family history of stone, or an anatomic abnormality of the kidneys was about the same as that in patients with stone as a whole. Parathyroid adenoma or hypertrophy was found at exploration of the neck in 8 (2.3%) of the 344 patients; these 8 patients had average serum calcium values of 11.2 mg. per 100 cc. or higher. All except one of these patients had high urine calcium values, the exception being a woman with poor renal function. The average serum calcium values in the 344 patients varied between 7.6 and more than 11.6 mg. per 100 cc. Eighty-five patients had average serum calcium values of 10.6 mg. per 100 cc. or higher, but only 31 of these patients had urine calcium values in excess of 300 mg. per day for men and 250 mg. per day for women. The remainder had normal or low urine calcium values. Patients with average serum calcium values greater than 10.5 mg. per 100 cc., who also have high urine calcium values or poor renal function, should be kept under observation with a view to subsequent neck exploration.

Analysis of stones was carried out in 136 patients; there appeared to be a definite relationship between the incidence of high urine calcium values and the structure and chemical composition of stones. A high urinary excretion of calcium does not, by itself, result in stone formation, but it increases the chance that stone formation will occur, and it appears to influence the type of stone formed.

Nephrogenous Polycythaemia. J. Forssell. Acta med. scandinav. **161**:169-179 (No. 3) 1958 (In English) [Stockholm].

Twenty-eight cases of nephropathy associated with secondary polycythemia are reported by the author. Hypernephroma was present in 22 cases, polycystic kidney in 4, fibromyxoma of the kidney in 1, and unilateral hydronephrosis in 1. Hematuria was found to be an important initial symptom, being observed in almost all cases of hypernephroma and in 1 case of polycystic kidney. Nephrectomy was performed in 13 cases, and with the exception of 1 case, where polycythemia did not develop until after the operation, it disappeared after removal of the affected kidney.

The role of the kidney in the metabolism of hemopoiesis is considered important in that removal of a tumor of the kidney, or of a whole affected kidney, sometimes results in the disappearance of polycythemia. Other investigators have found that this factor, which regulates erythropoiesis, is stimulated by various forms of anoxia and is responsible for the polycythemia known to occur at high altitudes. It has been observed in the umbilical cord in newborn infants, in congestive heart failure, after venous stasis in an extremity, in posthemorrhagic anemia, in erythroblastosis fetalis, and in Cooley's and sickle-cell anemia. Still other investigators have established that the hypophysis is the source of this factor or, at least, is closely associated with erythropoiesis. Jakobsen and coworkers, by removing almost every organ in turn, were able to show that the kidneys were the only possible source of erythropoietin production. A rise in the erythropoietin titer, variously caused, failed to occur after bilateral nephrectomy but not after ligation of both ureters. Should these theories prevail, there is still nothing to obviate the possibility that the nephrectomy performed in some of the present cases influenced the erythropoietin metabolism.

The Significance of Vesicoureteral Reflux in Children. V. A. Politano. North Carolina M. J. **19**:297-304 (Aug.) 1958 [Winston-Salem].

The author reports on 2 girls and 2 boys, aged 4, 6, and 12 years, respectively, with a history of persistent or recurrent urologic difficulties of from 5 months' to 2 years' duration. The diagnosis was established by cystography, either with exposure during micturition or with delayed exposure. Cystourethrograms during micturition have been more informative than cystograms with delayed exposure; however, in the very young child cystograms with delayed exposure will have to be sufficient.

The diagnosis in a 4-year-old girl was ectopic ureteral insertion with ureteral reflux and pyelonephritis on the left side. Treatment consisted of reimplantation of the left ureter by creation of a submucosal tunnel. This successfully corrected the vesicoureteral reflux. Postoperative intravenous pyelograms showed good excretion from the left kidney without evidence of obstruction. The child has remained asymptomatic for a period of 20 months. Microscopic examination of the urine was negative, and cultures have been sterile.

The 12-year-old boy was admitted for bilateral hydroureters and hydronephrosis. There was a 2-year history of enuresis. Preoperative diagnosis was bilateral vesicoureteral reflux. Some neurogenic disturbance of the bladder was strongly suspected as well. Treatment by bilateral reimplantation of the ureters with the use of a submucosal tunnel resulted in marked improvement of the preexisting hydronephrosis and hydroureters and in correcting the vesicoureteral reflux. During a year's observation 6 to 8 white blood cells were observed in the urine. The patient has, on occasions, shown some bacilli, but he has had no further recurrences of fever and chills.

In the 6-year-old boy the diagnosis was contracture of the vesical neck with median bar formation, bilateral reflux, and reduplication of the left ureter. The operative treatment consisted of excision of the double ureters on the left, reimplantation of the right ureter with the use of a submucosal tunnel, and a Bradford-Young repair of the vesical outlet. This succeeded in correcting the vesicoureteral reflux on the right side. Postoperative intravenous pyelograms showed good function in the remaining kidney and a normal excretory pyelogram. The urine has remained normal, and cultures have been sterile. The child has remained completely asymptomatic during the 6-month period that he has been observed.

Another 4-year-old girl was admitted with a history of recurrent abdominal pain, frequency of urination, intermittent fever, and malaise of a year's duration. She had been treated intermittently for cystitis and pyelonephritis with chemotherapy and antibiotics. Vesicoureteral reflux on the right side was diagnosed preoperatively. The creation of a submucosal tunnel has been most successful in correcting the reflux on the right, but reflux has persisted on the left side. Postoperative intravenous pyelograms demonstrated a normal upper urinary tract. The child has remained completely asymptomatic, her urine being normal without medication.

Vesicoureteral reflux should always be considered abnormal. Every child with repeated urinary tract infections, residual urine, unexplained fever, vague abdominal complaints, or flank pain should be studied for possible vesicoureteral reflux. Conservative measures directed at eliminating the cause or contributing factors should be tried first. If these fail, reimplantation of the ureters becomes a necessity to prevent total renal injury or loss. Any condition which can ultimately produce total renal destruction by progressively increasing back pressure or from repeated infections must be viewed as of grave significance and prognosis.

THERAPEUTICS

The Treatment of Idiopathic Thrombocytopenic Purpura: A Review of 93 Cases. E. J. Watson-Williams, A. I. S. Macpherson and S. Davidson. Lancet 2:221-226 (Aug. 2) 1958 [London].

The authors report on 28 male and 65 female patients, between the ages of less than 9 and 79 years, with idiopathic thrombocytopenic purpura. Twenty-six of the 93 patients did not receive specific treatment and were given whole-blood transfusion or hematinics. Of the remaining 67 patients, 31 received specific treatment which was instituted less than 100 days from the onset of symptoms (patients with a short history), and 36 received specific therapy which was instituted more than 100 days after the onset of symptoms (patients with a long history). Specific treatment consisted of steroid therapy with corticotropin (ACTH), cortisone, or prednisolone in 19 of the 31 patients with a short history, and in 8 of the 19 patients there occurred a complete remission which was maintained after treatment was stopped. Patients with a short history tended to have spontaneous remissions, and the onset of such remissions seemed to be hastened by steroid therapy. Steroid therapy was given to 23 patients with a long history, and 12 of these showed distinct improvement but this was never maintained for more than 60 days. In patients with a long history, the chances of a spontaneous remission or of a lasting remission from steroid therapy are small. Twelve of the 31 patients with a short history who did not receive steroids, and 7 who had failed to benefit from them, were subjected to splenectomy. Thirty-three of the 36 patients with a long history were treated by splenectomy, and 14 of the 33 had received preoperative steroid therapy. Splenectomy was followed by good results in more than 75% of the patients with a short history in whom a remission, spontaneous or induced, had not occurred. Splenectomy was followed by good results in 50 to 60% of the patients with a long history.

The results obtained suggest that the initial management of the patient with a short history of purpura should be blood transfusion, to replace any serious blood loss, and administration of cortisone (75 mg. every 6 hours) or prednisolone (15 mg. every 6 hours) for 3 weeks. If the platelet count rises during this time, there is a good chance that it will be maintained. If there is no improvement within 3 weeks, splenectomy should be performed in the expectation that at this time it will be followed by a good result in 75% of the patients. Patients with a long history of relapsing purpura should also be given a 3-week course of steroid therapy. All these patients should be subjected to splenectomy either during the steroid-induced remission or as soon as it is apparent that steroid treatment has failed to influence the platelet count. However, when a remission occurs, it may be justifiable to defer the operation in patients with milder cases, especially if the remission is a response to the first course of steroid treatment.

PATHOLOGY

Cerebral Blood Flow and Metabolism of the Brain During Acute Cerebrovascular Accidents: Effect of Certain Vasodilator Drugs. F. S. Feruglio and B. Migheli. Minerva med. 49:2440-2445 (June 20) 1958 (In Italian) [Turin, Italy].

The pharmacological effects of an Italian proprietary compound, Ronicol, made up of acetylcholine chloride, beta-pyridyl-carbinol, and pyridostigmine bromide, were investigated in 12 patients with acute cerebrovascular lesions of recent occurrence. Cerebral blood flow, oxygen utilization, and peripheral cerebrovascular resistance were measured by a method devised by Kety, immediately before and promptly after the intravenous administration of the compound. Fifteen observations were made on the 12 patients; these were divided into 2 groups, one consisting of 6 and the other of 9 observations.

The patients of the first group, all but 1 of whom were between 65 and 82 years of age, had small cerebrovascular lesions, either circumscribed (3 patients) or in the process of resolution (3 patients). Cerebral blood flow, oxygen utilization, and peripheral cerebrovascular resistance values deviated slightly from the normal values before the administration of Ronicol. The effect of the drug on these values was almost imperceptible. The patients of the second group, who were younger than those in the first group, had symptoms of recently developed acute and severe cerebrovascular lesions. The state of the cerebral blood flow and of the metabolism of the brain before the administration of the drug was the same as it was when the cerebral ictus developed. It consisted of a low cerebral blood flow, a reduced utilization of oxygen, and a significant increase in the peripheral cerebrovascular resistance. The sensory state of the patients was also affected, ranging from periodic breathing in some to coma in others. The administration of Ronicol to patients in this group produced an increased cerebral blood flow, a larger utilization of oxygen, and a decrease in the peripheral cerebrovascular resistance. The improved metabolism of the brain was evidenced by the disappearance of periodic breathing in the affected patients and by partial arousing of those patients who were in a semicomatose state.

Ronicol has thus proved to be effective in improving the cerebral blood flow and the metabolism of the brain during the first phase of cerebrovascular accidents. It is, however, less effective, or ineffective, in improving the cerebral blood flow and the metabolism of the brain after the first phase of the cerebral ictus, which is the most critical.

Nonpenetrating Traumatic Injury of the Heart. L. F. Parmley, W. C. Manion and T. W. Mattingly. Circulation 18:371-396 (Sept.) 1958 [New York].

Among 207,548 patients who died and on whom autopsies were performed at the Armed Forces Institute of Pathology in Washington, D. C., the authors detected 546 (0.1%) in whom death had resulted from nonpenetrating traumatic injury to the heart. These data show that the incidence of death resulting from cardiac injury caused by nonpenetrating trauma is low, although this type of injury is common, the lesion often being minimal and the morbidity slight. The character of forces responsible for the production of these injuries may be grouped in 7 categories: direct, indirect, compressive, decelerative, blast, concussive, and combined forces. Evaluation of the autopsy findings in the 546 patients and of the findings in additional clinical patients showed that myocardial rupture was most often the cause of death, whereas myocardial contusion and pericardial lesions were the most common injuries observed clinically. While ventricular rupture almost invariably was immediately fatal, 13 patients survived after atrial rupture for periods ranging from 30 minutes to 3 days. Since atrial rupture is amenable to surgical treatment, prompt diagnosis is essential. Five of 8 patients with rupture of the interatrial septum and 3 of 5 patients with rupture of the interventricular septum survived for short periods. These lesions may now be considered surgically correctible.

Of 105 patients with myocardial contusions or traumatic pericardial lacerations, 38 survived for varying lengths of time after the injury. Although such lesions are often well tolerated, the sequelae may be serious. Therefore, careful clinical evaluation of every traumatized person for possible cardiac injury is imperative, so that the more serious complications may be recognized and treated promptly. Thrombosis of a major coronary artery as a result of nonpenetrating trauma was not observed in this series and is considered rare. The effect of nonpenetrating trauma on a previously diseased heart is often serious, and the extent to which trauma aggravates a preexistent cardiac disease may often be hard to assess.

Transforaminal Curet Necropsy of Brain: A New Approach to Postmortem Tissue Diagnosis with Case History and Discussion. R. A. MacHaffie, G. J. Haslam, J. R. Walsh and I. D. Jones. Am. J. M. Sc. 236:284-289 (Sept.) 1958 [Philadelphia].

A technique for transforaminal curet autopsy on brain and meninges is described, which provides more adequate tissue specimens than the Vim-Silverman needle technique. The body preferably should not be embalmed prior to this procedure, as embalming prevents anteflexion of the neck to obtain the best approach to cerebral areas. This procedure does not, however, interfere with subsequent embalming of the brain or scalp. The position of choice is the lateral decubitus, with head anteflexed upon the chest in order to widen the aperture of the foramen magnum as much as possible. The head is maintained in anteflexion by an assistant while the pathologist inserts the guide needle of the Craig vertebral body curet through the foramen magnum in an anterocephalad direction. The curet cannula is slipped over the guide needle and advanced into the cisterna. The guide needle is removed, and cerebral spinal fluid is aspirated from the cisterna. When a sample has been obtained, a clean syringe is attached and the needle advanced to the right and inferiorly to enter the right lateral ventricle. Specimens of brain tissue are obtained from the right side of the midbrain, cerebral hemisphere, and pia-arachnoid and dura by toothed and hooked cutters, inserted within the lumen of the cannula, and by syringe aspiration. The cannula is withdrawn to the cisterna and inserted into the left side of the midbrain, lateral ventricle, and meninges for cutter biopsy. This technique is repeated in other areas of the brain until samples of all brain tissue except cerebellum and frontal lobes are obtained. The neck cannot be flexed sufficiently anteriorly to direct the needle into the cerebellum from this position.

The authors present the history of a 63-year-old man, who stated that he had been treated by a radiologist for chronic lymphocytic leukemia, and in whom a sternal puncture and cervical node biopsy revealed a chronic lymphatic leukemia. Nodes were palpated through the abdominal wall, and enlarged lymph nodes were present in the axillary, epitrochlear, femoral, and inguinal areas. Neurological examination was normal except for moderate nuchal rigidity and a positive Kernig's sign. Cryptococcus neoformans had been demonstrated in the leptomeninges with the aid of a mouse brain test. After the patient's death transforaminal curet autopsy on the brain confirmed the diagnosis of cerebral cryptococcosis. This method of curet autopsy on the brain appears to be adequate for the study of generalized brain disease and has the advantage of supplying larger fragments of tissue for study than the ordinary aspiration biopsy. While the results obtained with curet autopsy are not as exhaustive as those of the classical autopsy, it may be adequate to solve many problems of pathological and etiological nature, when the usual autopsy is denied.

RADIOLOGY

Trial Application of Cobalt Therapy to Buccal Cancers. Stuhl and Tournier. Presse méd. 66:1179-1180 (June 28) 1958 (In French) [Paris].

Radioactive cobalt (Co^{60}) was used with encouraging immediate results in treating 20 patients with advanced buccal cancers that were beyond the scope of ordinary radiotherapy. The basic physical characteristics of Co^{60} radiation are (1) its high energy (average, 1.25 mev) and (2) the fact that it is practically monochromatic, without soft components. The whole importance of cobalt therapy lies in certain theoretical advantages which flow from these characteristics. These are (1) the great activity, coupled with small size, of the source, which permits irradiation from a distance and a good geometric localization of the beam; (2) absorption by the superficial layers which is never preponderant, providing relative protection for the epidermis but making it impossible to use the skin reactions as a guide to treatment; (3) a depth dose which, for similar conditions of irradiation, is practically twice as great as that of the standard roentgentherapy; and (4) absorption which is practically the same for all tissues, whatever their density, so that the danger of radionecrosis of the bone is greatly reduced. This brief summary of the theoretical advantages of Co^{60} therapy shows how well adapted it is to the treatment of buccal cancers, which are often deep, hard to reach by the usual cross-fire technique, and masked by bone.

Techniques similar to those of conventional radiotherapy were purposely used in treating the patients in this series, so that the results of the 2 methods could be more easily compared. Two or more fields were generally used, and the tumor dose was always relatively high (5,000 to 8,000 r given at the rate of 150 to 250 r a day). Tolerance for the treatment, even with these high doses, was excellent. The administration of 6,000 r at the rate of 250 r a day was easily supported by the skin, which presented nothing more than a dry erythema followed by bronzing with mild itching for a fortnight. The mucosa, on the other hand, often showed mild, easily curable inflammation when the dose reached 3,000 r. No significant changes were noted in the general condition or, especially, in the blood picture during the treatment. The principal complications were radiation epithelitis or mucitis and, later, edema of either the soft tissues or the mucosa. The inflammatory changes were noted in 14 of the patients but necessitated definitive discontinuance of the treatment in only 1. Treatment had to be suspended in 3 others for one week, but after this interruption it was satisfactorily resumed. Significant radionecrosis of the bone did not develop in any of the patients, and a few were able to undergo dental extractions and operations involving bone resection after the radiation therapy. Radiocobalt therapy can also be reinstituted when necessary, e. g., in case of lymph-node involvement on the other side, or secondary extension to a neighboring organ. Several of these patients were still living at the time of writing, some with a follow-up of 1½ years, in spite of the fact that the disease was far advanced when the Co^{60} therapy was started.

ANESTHESIA

Employment of New Soviet Drugs for Potentiated Anesthesia in a Surgical Clinic. V. I. Kazansky and N. N. Rasstrigin. Khirurgiya 34:26-33 (No. 6) 1958 (In Russian) [Moscow].

Soviet drugs have been used by the authors since 1955 for potentiated local anesthesia, intubation oxygen-ether anesthesia, hibernation, and premedication of patients in employment of hypothermia. The following drugs are used: neuroplegics—aminasin, diprasin; analgesics—Anadol, promedol; parasympatholytics—metoxin (atropine). These drugs are combined into "lytic mixtures" in which the required and the main components are the neuroplegic and antihistaminic drugs. When these "lytic mixtures" are administered 15 to 20 minutes before the anesthestic, the patient becomes drowsy or even falls into a light sleep. There is a general inhibition of the central nervous system; the intensity of reactions to external stimulations is decreased; and fear of the operation disappears. This condition serves as a favorable background for any method of anesthetization. There is a block of the neurovegetative system, which helps to increase the resistance of the organism to operative trauma. Greater depth of anesthesia, with lesser expenditure of the main anesthetic, is attained when potentiated anesthesia is employed. Soviet drugs used in hypothermia promote its smooth course (absence of shivering, etc.). One of the side-effects in the administration of "lytic mixtures" is tachycardia due to the action of the neuroplegic and antihistaminic drugs. The authors consider it expedient to employ "lytic mixtures" for potentiation, since it gives a number of positive and valuable results.

Intraosseous Anesthesia in Operations on Extremities. V. P. Okhotsky. Khirurgiya 34:84-90 (No. 6) 1958 (In Russian) [Moscow].

Three hundred fifty surgical and orthopedic operations on extremities were carried out with the patients under intraosseous anesthesia. The essence of this method consists in the spread of Novocain solution, which has been injected into the spongy bone tissue, by osseous veins and surrounding soft tissues, with the following anesthetic action of Novocain on the nerve endings. The technique of this method of anesthetization consists in the following: A tourniquet is applied proximal to the operative field, and Novocain solution, 0.5%, is injected through a needle into the distal part of the metaphysis of the bone. The depth of anesthesia required for the operation is rapidly induced if the site of Novocain injection is chosen correctly. Complete circular anesthesia of the extremity up to the tourniquet is produced in 10 to 15 minutes. Toxic symptoms occasionally occur in intraosseous anesthesia, owing to rapid penetration of Novocain into the general circulation after removal of the tourniquet. Therefore, the author considers the increased individual sensitivity to Novocain a contraindication to intraosseous anesthesia. Before the operation a biological test should be carried out on all patients by intravenous injection of 10 ml. of 0.5% Novocain solution. If the patient is found to be sensitive, this method of anesthetization should not be employed.

PUBLIC HEALTH

Possibility of Infection of Human Subjects by Pigs with Coxsackie Virus Pneumonia. J. D. Verlinde, J. Versteeg and H. Beeuwkes. Nederl. tijdschr. geneesk. 102:1445-1447 (July 26) 1958 (In Dutch) [Amsterdam].

In July, 1957, a small but explosive epidemic occurred in a village of South Limburg province of the Netherlands. Eighteen children belonging to 6 families had fever (with temperatures up to 40.5 C [104.9 F]) and sore throat. The fever lasted for 3 days and subsided on the 4th day. Young pigs which had virus pneumonia were suspected of being the source of infection, since the children had visited a fair at which some of the pigs exhibited had had symptoms of this disease; the children became ill from 2 to 3 weeks after their visit to the fair. A Coxsackie virus, group A, type 5, was repeatedly isolated from the lungs of 2 pigs, and the serum obtained from the convalescing children showed a very high neutralization index to this strain. At first the strain was pneumotropic, but after 3 passages it was also myotropic for suckling mice. Intranasal inoculation of suckling-mouse carcass suspension produced virus pneumonia and specific antibody in healthy pigs.

Three Years' Experience with Poliomyelitis Vaccine—Ontario, 1955-57. W. G. Brown, G. K. Margin, B. Hannah and others. Canad. M. A. J. 79:155-162 (Aug. 1) 1958 [Toronto].

The 1955 poliomyelitis study group consisted of all the children, between the ages of 5 and 12 years, attending elementary schools in Ontario, the unvaccinated children serving as contratests. The total group was comprised of 672,249 children; 309,585 of these received 2 doses of vaccine, 6,924 received 1 dose (included for statistical purpose in the unvaccinated group), and 355,740 did not receive any vaccine. Among the 62 illnesses reported as possible poliomyelitis, 7 were classified as paralytic poliomyelitis (3 cases among vaccinated subjects), 4 as nonparalytic poliomyelitis, 8 as nonpoliomyelitic illness, and 43 as aseptic meningitis. The number of cases of poliomyelitis was too small to permit an opinion as to the effect of the vaccine. Of the 43 cases of aseptic meningitis, 23 yielded a Coxsackie or an enteric cytopathogenic human orphan (ECHO) virus on tissue culture.

The 1956 poliomyelitis study group was comprised of 840,000 vaccinated (2 or more doses of poliomyelitis vaccine) and 960,000 contratest or unvaccinated subjects. Among the 304 illnesses reported as poliomyelitis or polio-like illness, 76 were classified as paralytic poliomyelitis, 10 as nonparalytic poliomyelitis, 38 as nonpoliomyelitic illness, and 180 as aseptic meningitis. Five cases of paralytic poliomyelitis were reported among the 840,000 vaccinated children and 71 among the 960,000 unvaccinated, indicating that a significant difference existed in the attack rates of paralytic poliomyelitis between vaccinated and unvaccinated children. Of the 180 cases classified as aseptic meningitis, 103 yielded a cytopathogenic virus other than a poliomyelitic virus on tissue-culture examination.

The 1957 poliomyelitis study group included 1,800,000 vaccinated (2 or more doses of poliomyelitis vaccine) and 300,000 unvaccinated or contratest subjects. Among the 167 illnesses reported as poliomyelitis or polio-like illness, 38 were classified as paralytic poliomyelitis, 94 as aseptic meningitis, and 35 as nonpoliomyelitic illness. Seventeen of the 38 cases classified as paralytic poliomyelitis occurred among the 1,800,000 persons who had received 2 or more doses of poliomyelitis vaccine, 21 occurring among the 300,000 unvaccinated subjects, indicating, as did the previous year's study, a significant difference in the attack rates between vaccinated and unvaccinated children. Of *the 94 cases classified as aseptic meningitis,* 70 yielded a cytopathogenic virus other than a poliomyelitis virus on tissue culture. Experiences relating to the administration of over 4 million doses of poliomyelitis vaccine showed that the use of the immunizing agent was safe and remarkably free from associated reactions. No case of paralytic poliomyelitis was observed which could be ascribed to the vaccine.

The Management of Mass Casualties and the Flint Tornado. S. M. Lyttle. J. Michigan M. Soc. **57**:1112-1115 and 1151 (Aug.) 1958 [St. Paul].

On June 8, 1953, a tornado struck through the thinly populated area just to the north of Flint, Mich., and within 3 minutes it cut a swath 3 blocks wide and 4 miles in length; it completely demolished 200 homes and partially destroyed many others, killed 116 persons and injured 900 others, and caused an estimated property damage of $19,000,000. During the next 3 hours more than 500 tornado victims, along with relatives, friends, and volunteer workers, converged upon Hurley Hospital. This hospital, in which the surgical treatment of trauma has been well organized on a separate section for many years, has long been the trauma center for Flint. The presence of a well-organized house staff, including interns and residents, was of great value during the tornado emergency. It was the house staff who first saw the injured as they arrived at the hospital and initiated sorting and categorizing them according to type and severity of injuries. Although the hospital was already filled to overflowing with its regular patient load, 300 patients were admitted. Gradually, after admission, each floor became a self-contained sorting unit, and those patients who needed immediate definitive care emerged from the system.

The major injuries which were present in the 300 patients admitted were as follows: 49 craniocerebral injuries, with 11 associate skull fractures and 8 depressed skull fractures; 4 abdominal injuries, including 1 penetrating wound of the abdomen, 1 laceration of the mesentery and left kidney, 1 ruptured spleen, and 1 laceration of the transverse colon; 24 chest injuries, including traumatic pneumothorax, pulmonary contusions, cardiac arrest, traumatic rupture of the diaphragm, laceration of the lung, laceration of the pericardium, and hydropneumothorax; and 153 fractures of all types and in all locations. The relative number of open and closed fractures is not known. Closed and open reductions were done as indicated. Complex multiple injuries were the principal causes of death which occurred in 6 patients (2%). Most of the wound complications were those of infection Wound infections were first noted at about 48 hours, and until 96 hours, all wounds were examined every 5 or 6 hours, and smears and cultures were obtained. There were 35 cases of gas gangrene in the total of 57 wound infections. Of the 35 *patients with gas gangrene, major amputations were* done in 5 who showed evidence of systemic involvement and rapid dissolution. During the repeated inspection of wounds for gas bacillus infections and assemblyline method was used Dressings were removed at one station, wounds were inspected and cleansed at a second station and new dressings were applied at a third station This greatly facilitated the handling of the wounds

Sorting is the key to effective management of large numbers of casualties. It is the immediate grouping of patients according to type and seriousness of injury and their likelihood of survival and the establishment of priority for treatment to assure medical care of the greatest benefit to the largest number. The objectives of sorting are accomplished by designating patients within the following categories for treatment: (1) minimal; (2) immediate (3) delayed; and (4) expectant. Minimal treatment should be confined to patients who can be treated safely and sent on about their business. Immediate treatment should be carried out for patients for whom expedient procedures will save life or limb. Delayed treatment is for patients who, after having received emergency care, incur little risk by delay in further treatment. Expectant treatment should be reserved for patients so critically injured that only complicated and prolonged treatment offers any hope for improving life expectancy. Another important principle is that, except for lifesaving procedures, nothing should be done that decreases the patient's ability to care for himself.

Antibiotic Resistant Staphylococci: Familial Infections Caused by Exposure of Babies in Hospital Nurseries. V. Hurst and M. Grossman. California Med. **89**:107-110 (Aug.) 1958 [San Francisco].

The families of 2 infants, who have been subjected to an intensive follow-up study, are cited to illustrate the fact, that infants born during an outbreak of infection from a nursery Staphylococcus organism, which has been variously identified as

80/81, 52/42B/80/81, or 42B/44A/47C/52/80/81, frequently transmit the organism to members of their families. The first newborn infant left the hospital with impetigo, harboring the infectious strain on various unaffected portions of the skin and mucous membrane. In the second postpartum week the mother developed a breast abscess which yielded the same infectious strain. Within the first 8 months of the infant's life all the members of its family had a staphylococcic infection, but only the 7-year-old sibling received medical attention for a furuncle with lymphangitis from which the infectious strain was recovered. Cultures obtained from the nose and the throat of all the family members at 13 months were negative save for the 9-year-old child who had never had an infection. Cultures obtained from the skin and the nose of a 14-year-old cousin, seen 2 months later with impetigo of the lower extremities, grew the infectious staphylococci.

The second infant left the nursery as an asymptomatic carrier. Within the next 3 months various family members had intermittent boils, but only the infant received medical attention for the lesions. Culture materials from the nose and the throat, obtained from the entire family during the 4th month, revealed that the mother, the infant, and 2 siblings were carrying the infectious strain. The entire family was treated to no avail with tetracycline, 4 of the 5 previous carriers continuing to harbor the infectious strain in their throats. On last examination at 13 months the infectious strain was recovered from the nose, the throat, and a boil of the mother as well as from the nose and the throat of the 2 siblings. Although cultures from the nose and the throat of the infant have been negative, the strain seems securely rooted in this family and likely to persist. Antibiotic-resistant staphylococci are far more widely distributed in the community than is generally recognized. Their prevalence will continue to increase as long as newborn infants bring them home from the nursery and seed the population.

Unusual Salmonella Infections. A. Balows. J. Kentucky M. A. 56:770-773 (Aug.) 1958 [Louisville].

An indication of the protean nature of infections with Salmonella organisms is the fact that at present well over 400 species or serotypes are recognized, every one of which is pathogenic for man, animals, or both. Such an infection may present itself in the guise of various clinical and pseudosurgical syndromes. This fact and the lack of adequate laboratory facilities, coupled with a wide range of clinical manifestations, are largely responsible for the apparent failure to consider the Salmonella organism as the etiological agent in many undiagnosed infections.

The author reports 5 cases of unusual Salmonella infections. Upon removing the sutures from the incision of a 76-year-old woman who had been subjected to gastrectomy for reticulum-cell sarcoma, a small amount of exudate was noted at one end of the incision. Salmonella typhosa was isolated from a culture of this exudate. After a 10-day lapse the patient was readmitted with a severe diarrhea, and stool culture also grew out Sal. typhosa. The patient died after the 10th hospital day. A 36-year-old white restaurant operator was admitted with a tender swelling of the 8th rib on the right lateral side. Irrigation and drainage yielded a thin watery fluid; a growth of Sal. oranienburg was obtained from the culture. A 45-year-old man, with a history of a severe typhoid or thyphoid-like infection as a child, underwent sequestrectomy for persistent drainage after an operation on the left radius for osteomyelitis, which at one time had been diagnosed as tuberculosis. Curettage specimens were later identified on culture as Sal. schottmülleri (Sal. paratyphi B). The lesion healed and drainage stopped after extensive chloramphenicol therapy. A 78-year-old diabetic woman was admitted to hospital upon complaint of chills and fever and vague abdominal discomfort. Hospital findings were negative save for those of uncontrolled diabetes. A blood culture was taken, and a growth identified as Sal. choleraesuis was obtained. Upon readmission, the white blood cell count was elevated, and the patient was dyspneic. A roentgenogram of the chest now revealed a large amount of atelectasis of the right lung with encapsulated fluid. Serosanguineous fluid (150 cc.) removed from the right side of the chest yielded a growth of Sal. choleraesuis on culture. The patient died on the 12th hospital day, death being attributed to pneumonia with pleural effusion secondary to gastroenteritis caused by Sal. choleraesuis. A 63-year-old man, who as a young man had had a severe case of typhoid, was admitted to the urology service complaining of oliguria of one-year duration; he had now sought medical attention only after complete urinary retention, accompanied by severe pain, had ensued. An emergency meatomy was performed and was followed by a suprapubic cystostomy. Portions of necrotic prostatic tissue removed at prostatectomy shortly thereafter and some fluid obtained from bladder washings both yielded a growth identified on culture as Sal. typhosa. It was ascertained by verbal report that 1 and possibly 2 cases of typhoid were directly attributable to this patient. The occurrence of typhoid bacilli in prostatic tissue in the carrier is extremely rare, no cases having been found in the literature available.

In the opinion of the author Salmonella organisms must be considered in any type of bacterial infection, whether it be a simple abscess, meningitis, endocarditis, pelvic inflammatory disease, pneumonia, or urinary tract infection. Reserving a diagnosis of Salmonella infection for those patients who show a characteristic gastroenteritis or typhoidal or septic syndrome will continually fall short of revealing the true extent and diversity of salmonellosis.

BOOK REVIEWS

Advances in Pediatrics. Volume X. Editor: S. Z. Levine. Associate editors: John A. Anderson and others. Cloth. $9. Pp. 362, with illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11; Interscience Publishers, Ltd., 88-90 Chancery Lane, London, W. C. 2, England, 1958.

As part of a continuing series of comprehensive pediatric topics, this volume continues the excellent high standards, readability, and presentation of practical information. The subjects covered include psychological principles in pediatric practice, the pediatrician and the sick child, treatment of tuberculosis in childhood, convulsive disorders in infants and children, prevention of poliomyelitis by vaccination, staphylococcic infections in nurseries, muscular disorders of childhood, and the transfer of antibodies from mother to offspring. The detailed discussion on the pediatrician and the sick child should be of special value, and the general considerations on the practical application of the "art" of medicine should be useful to every practicing physician. This section should be of even greater value to the graduating medical student and house staff member. The total patient reactions to acute and chronic illness, along with management (including parent management), have never before been described in such a precise and all-encompassing manner.

The section describing the treatment of tuberculosis in childhood gives every practitioner sufficient general principles to treat, and, more important, to prevent, all forms of childhood tuberculosis. In the chapter on the prevention of poliomyelitis by vaccination, sufficient background material is presented to allow adequate interpretation of future advances in poliovirus vaccines, especially the orally administered type. The chapter on staphylococcic infections in nurseries is timely. The discussion on epidemiology and prevention of this extremely publicized entity merits the attention of every physician. The material is presented in such a manner as to allow those who are unfamiliar with the subject to evolve an initial understanding and to follow the details. The book is basically a reference volume, each section having an abundant bibliography.

Atlas der gastroenterologischen endoskopie. Von Prof. Dr. Reinhold Boller. Cloth. 288 marks. Pp. 381, with 313 illustrations. Urban & Schwarzenberg, Frankgasse 4, Vienna IX; Innsbruck, Austria, 1958.

This is one of the outstanding contributions to contemporary medical literature. The author began the work in 1942 by making sketches of some gastroscopic images. He then engaged an eminent painter, one Lepier, whom he had instructed in endoscopy, and for many years the artist and scientist worked together to evolve this magnificent volume. The painter observed the color and form of the various lesions, and the author advised him what aspects would be of greatest value to the reader. The entire work was a heroic undertaking. The author points out that color is much to be preferred to the usual monochrome of photography. The photographic lens may distort certain facets of the image, whereas color renditions, if properly presented, are the ideal means for studying and presenting to the observer what the author wishes to impart. The book depicts normal and abnormal areas not only by gastroscopy but also by laparoscopy, rectoscopy, and sigmoidoscopy. Under gastroscopy various abnormalities of the esophagus are shown. Over 30 illustrations are devoted to gastritis alone. This is followed by a comprehensive and thorough study of gastric ulcer followed by consideration of gastric polyps and malignancies. Under laparoscopy, the various images of the normal peritoneum and the various lesions observed intra-abdominally are brought to view. The same holds true for rectoscopy.

This work must be seen to be appreciated. It should be a priceless addition to any progressive surgeon's library. After each section are some blank pages on which the reader may record his own observations. The index is comprehensive. The publishers have apparently spared neither time nor money, and the author spared no effort to create this magnificent work. It can be highly recommended from every point of view. The text is written in German, and a great service to the medical and surgical profession would be rendered if the book were translated into English and other languages.

Die neuroallergischen Beziehungen in der Histopathologie der Multiplen Sklerose. Von Tibor Lehoczky. Cloth. $7. Pp. 176, with 209 illustrations. Verlag der Ungarischen Akademie der Wissenschaften, Alkotmány Utca 21, Budapest V, Hungary; Akademie-Verlag, Berlin, Germany, 1957.

This monograph reports on the histological examination of specimens from 20 patients with multiple sclerosis. In 16 of the patients the disease had a slowly progressive course and in 4 there were remissions and exacerbations. The latter subsequently developed a chronic trend. The author considers the optic system as the site of predilection for the lesions as indicated by the high incidence of involvement: the optic chiasm in 55%;

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

optic tract or optic nerve in up to 45%; the lateral geniculate body in up to 25%; the white matter around the posterior horn in up to 85%; that around the inferior horn in up to 55%; and the thalamus in up to 33%. He reviews in detail the histological features of thrombus formation, perivascular infiltration, the perivascular and perifocal variety of tissue edema and the "spongy degeneration" of areas remote from the lesions, perivascular parenchymatous rarefaction, and granuloma formation, and he discusses the significance of hemorrhage and the relative preservation of the nerve cells. He emphasizes that the morbid process in multiple sclerosis extends over the entire central nervous system and that in 60 to 80% there was histological evidence of recent activity. The latter was manifested clinically by the episodes of exacerbations of neurological symptoms.

According to Lehoczky the histopathological process of multiple sclerosis is characterized by (1) hyaline degeneration and fibrous "delimitation of the vascular wall"; (2) edema and swelling of the endothelial cells; (3) precapillary and capillary prestasis and stasis; (4) precapillary and capillary thrombosis; (5) perivascular infiltration (85% "polyblasts" and the rest lymphocytes); (6) hemorrhage; (7) perivascular, perifocal, and diffuse edema; (8) partial and total necrosis; (9) perivascular parenchymal rarefaction (microplaque); and (10) granuloma formation, and microglia and histiocytic reaction. He agrees with such previous investigators as Pette, Ferraro and co-workers, Wolf, Kabat and co-workers, Roizin and Kolb, Jerris, Alvord, Lumsden, Lhermitte, and Allegronza and Rovescalli that these features link the disease to experimental and human neuroallergy (Goddard). He believes that an allergic mechanism plays a deciding role in the cause and pathogenesis of multiple sclerosis. This monograph should be of value to all students of neurology and especially to those interested in the lesions and pathogenesis of the demyelinating diseases.

Lifetime Health Record. By David D. Rutstein, M.D., Professor of Preventive Medicine, Harvard Medical School, Boston. Cloth. $2.25. Pp. 127. Harvard University Press, 79 Garden St., Cambridge 38, Mass., 1958.

Valuable educational aspects are combined in this small volume with useful guides on the recording of important medical facts that all too often are forgotten or distorted with the passage of time. Perhaps the most significant feature is the ease with which the booklet can be used. In a two-page introduction, Rutstein provides a thorough explanation of how the records can be prepared and the reasons for their importance. Space is provided for birth information, as well as for recording data on immunizations. Growth records to age 25 can be kept, and there is an extended portion in which adult weight records can be maintained. Other items covered include hospital admissions, operations, accidents, and blood transfusions, both given and received. The record can be kept in even greater detail, if desired, with space for blood examinations results, urine tests, electrocardiograms, other special laboratory studies, and general results of routine health examinations. Of definite importance in many situations is information about major illnesses, reactions to drugs, and corrective devices that may be used. There is a special section for the female health record, with spaces for information regarding menses and pregnancies. Another special section permits listing of information about insurance policies, often not available when needed. On the last page, the author lists eight warning signals that can be readily understood by the average person. The warnings regarding early signs of cancer are incorporated into these. Although some physicians might be reluctant to encourage patient listing of items such as blood pressure, urine analysis, and blood cell counts, there are many aspects of this volume that recommend it highly. Unfortunately, its productive use still is subject to the inescapable fact that the average human being does not keep any sort of record adequately and consistently.

Negroes and Medicine. By Dietrich C. Reitzes. Cloth. $7. Pp. 400. Published for Commonwealth Fund by Harvard University Press, Cambridge 38, Mass.; Oxford University Press, Amen House, Warwick Sq., London, E. C. 4, England, 1958.

The study contained in this volume was conducted by the sociology department of the University of Chicago in the period Oct. 1, 1955, through March 31, 1957. It provides an interesting and informative presentation of opportunities for Negroes in medicine, and the general status of medical care for and by Negroes, through a comparative analysis of 14 communities across the United States. The first section of the report analyzes both Negro applicants to medical schools and Negro medical students. All data dealing with this analysis were obtained from such sources as the Association of American Medical Colleges, the registrars of Howard University School of Medicine and Meharry Medical College, and a questionnaire survey of other approved medical schools in the United States. Statistical information reveals that in 1950 the Negro population of the United States accounted for 10% of the total population, but only 2.2% of all physicians were Negro. Between 1938-1939 and 1955-1956 the number of Negro medical students increased 117% (from 350 to 761) while all medical students increased 34.4% (from 21,302 to 28,639). Furthermore, the proportion of Negro students attending medical schools other than Howard and Meharry gradually increased during this same period from 12.9% to 31.0%. This portion of the report deals with the problems encountered by Negro students during premedical years, the M. C. A. T. scores made by them, the various regional patterns and scores of Negroes in predominately white schools, the relationship between type of college and type of medical school, and other pertinent information.

The second and larger portion of the report deals with a study of medical care by and for Negroes, based on an analytic study of 14 communities representative of different areas of the nation (Philadelphia, New York, Boston, Chicago, Gary, Detroit, Indianapolis, Los Angeles, Washington, D. C., St. Louis, Kansas City, Mo.; Atlanta, Ga., New Orleans, and Nashville, Tenn.). These communities varied from "no integration" to relatively "high integration." In each community analysis the study included interviews with sociologists, local human relations organizations, and selected persons. The description of the findings in these various communities is enlightening for it presents the problems encountered by Negro physicians and Negro patients in these various environmental settings. Each community was found to be unique, but the study did reveal certain key factors which functioned in varying patterns. These include the existence and importance of predominately Negro hospitals, the presence of influential people or groups actively interested in integration, opportunities for professional contact between Negro and white physicians, type of strategy used by Negro physicians in obtaining hospital appointments, qualifications of the Negro physician, and their own professional relationships, as well as the race relations pattern characterizing each community. The volume is a valuable contribution to the field of race relations, medical education, and medical care.

The Cerebral-Palsied Child: A Guide for Parents. By Winthrop M. Phelps, M.D., Thomas W. Hopkins, Ph.D., and Robert Cousins. Foreword by Frances R. Horwich, Ph.D. Introduction by Dean W. Roberts, M.D., Director, National Society for Crippled Children and Adults, Inc., Chicago. Cloth. $3.95. Pp. 237. Simon & Schuster, Inc., 630 Fifth Ave., Rockefeller Center, New York 20, 1958.

No one can deny that the parents of handicapped children need and can benefit from professional guidance. Most books which purport to be guides for these perplexed parents fall short of their goal by being either too technical or too simple. This book, however, comes closer than previous ones to the ideal in serving as a guide to parents. The authors include an orthopedic surgeon who has pioneered in the study of the cerebral palsied child, the principal of a special school for handicapped children, and a professional writer who is the parent of a handicapped child. The book is clearly written and well organized. The first five chapters deal with the etiology, clinical syndromes, and treatment of the condition and the next five with the social and emotional problems, general hygiene, and parental aspects. Other chapters deal with recreation, education, and vocational rehabilitation. There are two appendixes, one giving a list of the United Cerebral Palsy Association affiliates, and another a somewhat incomplete regional directory of day and boarding schools for cerebral-palsied children. Although the book contains many controversial statements, it does supply a great deal of information of use not only to parents but also to therapists, teachers, and even physicians. In fact, the great amount of medical information encompassed in the book might easily be confusing to all but the most well-informed parents. The value to parents would have been enhanced if illustrations had been provided. In its present form, the book is probably more useful as a guide to those who will guide the parents than to the parents themselves.

Systemic Ophthalmology. Edited by Arnold Sorsby. Second edition. Cloth. $25. Pp. 682; 19, with 277 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Butterworth & Co. (Publishers), Ltd., 88 Kingsway, London, W. C. 2, England, 1958.

This highly regarded textbook has been thoroughly revised and brought up to date. Its distinguished contributors discuss every ophthalmological lesion related to general disease. Of interest to American physicians, and as an indication of the international character of the text, 10 of the 34 authors are from the United States. The material has been arranged in six parts, dealing with (1) prenatal influences, (2) inflammations, allergic reactions, and infections, (3) nutritional, metabolic, and endocrine disturbances, (4) central nervous system, (5) cardiovascular and hematopoietic systems, and (6) other general disturbances. Copiously illustrated, with the inclusion of 24 color plates, well written, and ably edited, this book stands preeminent in its field. It should be a valuable reference book for the clinical ophthalmologist. To the general physician with an interest in ocular manifestations of systemic diseases it should likewise prove of immense practical value. It is unfortunate that its bulk makes perusal by the medical student unlikely, for it should be particularly helpful to him also.

Medical Electrical Equipment: Principles, Installation, Operation and Maintenance of Electrical Equipment used in Hospitals and Clinics. Advisory Editor: Robert E. Molloy, M.B., F.F.A., R.C.S. Contributors: P. S. Allgood and others. Cloth. $15. Pp. 312, with 238 illustrations. Philosophical Library, Inc., 15 E. 40th St., New York 16, 1958.

This text contains brief descriptions of the basic principles, operations, and maintenance of medical electric equipment which may be customarily found in general hospitals. Diagnostic or therapeutic indications for the use of this equipment or the techniques of application to the patient are not given. The equipment considered includes room illumination systems, airconditioning and refrigeration, x-ray apparatus, radioisotope diagnostic equipment, various heat and ultraviolet energy sources, and respiration equipment. The text deals with hospitals and equipment found in the United Kingdom, and its material is not directly applicable to the United States. The text may be of some help and interest to the hospital engineer, but it is doubtful that physicians generally will be interested in it.

Illustrated Preoperative and Postoperative Care. By Philip Thorek, M.D., F.A.C.S., F.I.C.S., Professor of Surgery, Cook County Graduate School of Medicine, Chicago. Cloth. $5. Pp. 98, with 60 illustrations, drawings by Carl T. Linden. J. B. Lippincott Company, East Washington Sq., Philadelphia 5; 4865 Western Ave., Montreal 6, Canada; Pitman Medical Publishing Company, Ltd., 45 New Oxford St., London, W. C. 1, England, 1958.

The author, who is well known for his knowledge of surgery and his writing, has put together in simple readable form a wealth of material without wasted words. Amply illustrated and attractively printed, this book should appeal to practitioner, intern, resident, nurse, and student. It simplifies some aspects of surgical care that seem to have become at times unnecessarily complicated. While it will not replace textbooks, it should provide quick reference and should be regarded as a companion to more comprehensive textbooks.

Clinical Enzymology. Edited by Gustav J. Martin, Sc.D., Research Director, National Drug Company, Philadelphia. Cloth. $6. Pp. 241, with illustrations. Little, Brown & Company, 34 Beacon St., Boston 6; J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London, W. 1, England, 1958.

This volume contains a discussion on enzymes used in clinical medicine—largely on those administered parentally, but also a limited discussion on those used diagnostically. Its seven chapters are written by six authors. The subjects covered include protein biology, the chemistry and biochemistry of enzymes used clinically and their parental use in medicine, enzymes used in diagnosis, and polymerases. Much of the chapter on protein biology deals with enzymes. Their mode of action and the effect of concentration on their action as well as the antigenicity of enzyme preparation and the cell permeability to enzymes are discussed. The three chapters on the chemical, biochemical, and medicinal aspects of clinically used enzymes deal chiefly with trypsin, chymotrypsin, ribonuclease, hyaluronidase, cholinesterase, streptokinase, and desoxyribonuclease. The enzymes used for diagnostic purposes include the phosphatases, amylase, trypsin, lysozyme, hyaluronidase and antihyaluronidase, uropepsin, cholinesterase, and transaminase. This volume is somewhat uneven in that the chapters contributed by the editor have a more philosophical bent than those written by the other contributors, who tend to adhere to more factual material. This is probably because the subject matter of the latter group is more clearly defined. The book should be of interest to physicians, biological scientists, and students because it includes therapeutics. It collects and systematizes a great deal of scattered material on the parental use of enzymes, and, although much of the material is brief and sketchy, it contains numerous references to the original literature. A general index is also included.

Basic Cardiology. By T. E. Gumpert, M.B., Ch.B. F.R.C.P. Cloth. $6. Pp. 168, with 72 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; John Wright & Sons, Ltd., 42-44, Triangle West, Bristol 8, England, 1958.

This unpretentious monograph appears to represent the accumulated experience of the author. The approach is that of the general physician with an abiding interest in cardiology. The book is not designed to replace a standard textbook on cardiology, but covers this field from the clinical viewpoint with a minimum of detail. The style is conversational, and the text is amusing in places. The material is up to date and is sound, clinically, for its level. There is room for disagreement with some of the electrocardiographic interpretations, and certain hemodynamic explanations, such as that of patent ductus arteriosus. There is no bibliography. The illustrations are good, although more care might have been taken in the preparation of some of them. This book should be of value as a review for the physician whose primary interest is not cardiology.

How to Write Scientific and Technical Papers. By Sam F. Trelease. [Volume is outgrowth of two earlier books: "Preparation of Scientific and Technical Papers" and "The Scientific Paper, How to Prepare It, How to Write It."] Cloth. $3.25. Pp. 185, with 6 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1958.

This is another handy-size volume on the preparation of papers, which contains little that is new but is offered in an interesting style. While most of the information available in books intended to guide authors in the scientific field could be summarized in a few pages, there is a need for amplifying presentations so that it becomes lively rather than dry. Furthermore, examples tend to impress the reader with the need for certain rules. This book, like others, serves its purpose, and it offers some additional information on the preparation of lantern slides, graphs, photographs, and other illustrations which may well make it especially appealing to a number of prospective users.

QUESTIONS AND ANSWERS

ALLERGIC CONJUNCTIVITIS

To the Editor:—*A treatment used for allergic conjunctivitis has been 4 cc. of 1:1,000 epinephrine, with rose water added to make 1 oz. However, there have been several complaints of a nervous, jittery feeling, very likely from the epinephrine. What percentage of the epinephrine is absorbed systemically from the eye?*

M.D., North Carolina.

Answer.—Allergic conjunctivitis is more often due to drugs than any other cause. Vasoconstrictors, such as epinephrine, naphazoline hydrochloride, ephedrine, and phenylephrine are mildly, if ever, allergenic or even irritative. Consequently, a solution containing one of the vasoconstrictors may be effective in providing relief of acute symptoms of pollen allergies more completely than any other local medicaments. In highly sensitive individuals who exhibit a violent reaction to intradermal or scratch tests, epinephrine (1:1,000) or any other vasoconstrictor should be instilled immediately. In the delayed type of allergic reactions in which the sensitization is a property of the cells themselves, the reactions are not affected by epinephrine. In mild cases of hay fever conjunctivitis, the use of combinations of vasoconstrictors, anesthetics, and cleansing agents are sufficient. Theodore and Schlossman (Ocular Allergy, Baltimore, Williams & Wilkins Co., 1958, p. 40) state that a mixture containing one drug from each of the following group is useful: (1) epinephrine (1:5,000), naphazoline (1:5,000), or phenylephrine (1:500); (2) cocaine, 0.33%; and (3) sodium propionate, 5%, or zinc sulfate, 0.25%. For relief of symptoms in vernal conjunctivitis, the subconjunctival injection of epinephrine (1:1,000) is recommended. In nonspecific therapy for allergic edema of the eyelids with conjunctivitis, the intravenous administration of antihistaminic drugs with ephedrine is especially valuable. Epinephrine is, of course, the drug of choice when anaphylactic reactions or edema of the glottis occur. Even in chronic cases it often affords relief in patients unresponsive to other medicaments. The injection of epinephrine (1:1,000) in amounts of 1 cc. is not uncommon in treatment of allergic reactions, migraine, and shock. In amounts of 1 to 5 cc., it has been administered by mouth to stop gastric hemorrhage. In the course of surgical operations, the injection of up to 10 cc. has frequently been used to aid in the control of bleeding. Epinephrine is not an allergenic agent, and its absorption does not cause sensitization or nervous or psychic reactions. Comparatively large amounts of it may be administered by injection, by instillation, or by mouth without danger of initiating unfavorable results. The weak solution of epinephrine alluded to in the question could not be regarded as a cause of "a nervous, jittery feeling" after instillation into the eyes at any frequency. It is not possible to estimate the absorption of the epinephrine through the conjunctiva, as some of the solution would be washed out by tears and squeezed out by blinking of the eyelids. Considering the amounts of epinephrine commonly used therapeutically in patients with allergy, it is not at all conceivable that absorption of epinephrine from the lotion, as indicated, is responsible for the symptoms described.

HEARING SCREENING TEST

To the Editor:—*In a school health program, the nurses do a hearing screening test on all first, fifth, and ninth grade students. In this screening examination, a sweep-type, pure tone audiometer is used. A level of 20 db. has been used in frequencies of 125 through 8,000 cps. There has been some question regarding the number of frequencies, as well as the rotation of frequencies in the testing. For instance, should the examination be begun in the right ear at 125 cps, with movement up through 8,000 cps, and then changed to the left ear starting at 8,000, with movement down to 125 cps? Please give information on the method of hearing screening tests in school children.* *Albert E. Woeltjen, M.D., Dixon, Ill.*

Answer.—The most desirable periodicity for school hearing screening examinations has not been definitely determined. The decision can best be made at the local level through consultation among school personnel, otologists, audiologists, and representatives of community health agencies. Routine annual testing in the lower grades with less frequent checks in the upper grades has been advocated. Regardless of the interval between routine tests, an individual check is warranted whenever a child shows signs of hearing impairment. A competent teacher, nurse, or even volunteer can learn to administer a screening test for hearing reasonably well. However, it is not generally advisable that the time of such personnel be used for hearing screening tests because of other responsibilities more

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

specific to their training. Whenever possible, an audiometric technician who is especially prepared to perform hearing screening tests in children should be available.

For individual screening, two tests are most commonly recommended; each employs the pure tone audiometer. In the sweep check test the intensity dial is usually set at 15 db. Ordinarily, the right ear is tested first. The left ear is then tested in the same way. The "screener" sweeps through the various frequencies rather quickly from 250 to 4,000 cps inclusive. The child is asked to indicate by nodding or with a hand signal whether he hears. The usual technique involves starting in the middle range and working up and down. Twenty-five to 30 children can be tested in an hour by the sweep check method. Children who fail to hear sounds at the 15-db. level at two or more frequencies in the same ear should be retested. For retesting, the threshold acuity test is generally recommended. The right ear is tested first, with an accluder covering the other ear. This procedure is much more accurate than the sweep check test but takes from 5 to 15 minutes for each child. Usually, the 1,000 cps frequency is selected as the starting point, with the intensity high enough for the child to hear. The sound is gradually lowered until it can no longer be heard and is then increased until it again becomes audible. This process is then repeated until a uniform response is obtained. Other frequencies are subsequently tested in the same way, covering a range from at least 250 to 8,000 cps. A retest is made of children who fail in either ear to hear the sounds at 15 db. at two or more of the above frequencies. Failure in the second test is reason for referral for otologic examination. Certain special group tests with use of the pure tone audiometer are available, such as the Massachusetts Hearing Test (Johnston, *J. Acoustical Soc. America* 20:697, 1948) and the Johnston Group Pure Tone Test (Johnston, *J. Speech & Hearing Disorders* 17:8, 1952). With these tests, screening can be done in more children in less time, but their accuracy as compared to the individual pure tone check is open to question.

NONSPECIFIC EPIDIDYMITIS

To the Editor:—*What is the currently recognized therapy for acute nonspecific epididymitis? Is bloody seminal fluid a usual accompaniment? What measures should be taken to determine etiology?*

M.D., New Jersey.

Answer.—Acute nonspecific epididymitis in the usual case is often caused by one or the other of the gram-negative bacilli frequently found in the urinary tract. Occasionally, this will be due to a staphylococcus or streptococcus. In those cases of acute epididymitis in conjunction with a subacute or acute infection of the lower urinary tract, chemotherapy or antibiotic therapy, depending on the organism found, is definitely indicated. However, in those patients who develop an acute epididymitis related to overdistention of the bladder or lifting of a heavy object when the bladder is full, experience has shown that chemotherapy or the use of the wonder drugs is of little or no value. Certainly at the present time, the immediate treatment should consist of definite support to the scrotum, and this is best done by the use of an athletic supporter. The usual sac-like supporter is of very little value. In most instances in the acute stage, the application of an ice bag to the inflamed part will be comforting. In the absence of general systemic reaction, such as fever, chills, malaise, and nausea, there is little to gain by keeping the patient in bed. These patients should be cautioned not to strain or push at the time of voiding and not to let the bladder get too distended. Fluids, of course, should be forced. At times, the pain in relation to the inflamed area is quite severe and the administration of codeine and aspirin by mouth or one ampul of 10% calcium gluconate given intramuscularly will be of benefit. In regard to the question of bloody seminal fluid, this is most likely due to the rupture of a small vein in relation to the verumontanum, and it is not believed to be due to an important lesion in the urinary tract. Usually, reassurance is enough to satisfy the patient, but, in the particularly apprehensive individual, cystoscopy and careful evaluation of the urethra may be indicated.

CHANGE OF RH FACTOR

To the Editor:—*Can the* Rh *factor change in a person without previous blood transfusion or previous pregnancy? Also, since an individual's blood group is dependent on the presence or absence of A and B blood group substances which are present at birth, can these groups change?*

E. Burns Gray, M.D., Widen, W. Va.

Answer.—The Rh factor of a person cannot change without a previous blood transfusion or pregnancy. It cannot change even with a previous pregnancy, but under certain circumstances it may appear to have changed after a previous blood transfusion. A transfusion of Rh-positive blood given to an Rh-negative recipient who does not have Rh antibodies will produce in him a mixture of Rh-positive and Rh-negative blood, because Rh-positive red blood cells will be tolerated by him until he develops Rh antibodies. During that time, a test of his blood could result in an erroneous interpretation that he is Rh-positive. Actually, the true nature of the blood can be readily recognized by an experienced examiner who will not overlook the large number of unagglutinated red cells. This potentially misleading situation is transient and remains only as long as it takes for the host to become sensitized to the heterologous blood cells. The same potentially misleading condition may result when Rh-negative blood is administered to an Rh-positive recipient. This is the case in exchange transfusions in fetal erythroblastosis. There, the Rh-positive infant may become transiently Rh-negative for a few weeks. Here too, the true blood group status will become manifest as soon as the infant begins producing Rh-positive erythrocytes. As soon as the production of his own red blood cells asserts itself, the infant has a mixture of his own Rh-positive red blood cells and of the transfused Rh-negative erythrocytes. Eventually, the transfused Rh-negative blood is eliminated and the true Rh-positive status reestablished. Exchange transfusions of Rh-negative blood given to Rh-positive adults have a similar effect and course. A and B blood groups cannot change with or without a previous blood transfusion or pregnancy. However, there is a special situation in the case of blood factor A which requires mentioning. There are several subgroups of A which differ in their ability to be clumped by corresponding agglutinating serum. This could possibly lead to errors and to seeming changes in the blood factor A, but only in the hand of the inexperienced worker. In a case reported recently (Van Loghem and others, *Vox Sanguinis* 2:16, 1957), a man suffering from chronic granulocytic leukemia was typed as group A in 1953, but a year later the A reacted less distinctly. However, the experienced examiner using well-established methods of identification could recognize the irregularity even without knowing about the previous result. He would have established the true blood group without much difficulty. In other words, even in this isolated instance there was no true change of the blood group. It is important to recognize that this and similar reports do not detract from the reliability of blood group determinations in medicolegal practice.

FIRST USE OF BLOOD TRANSFUSION

To the Editor:—*Please give historic information on the discoverers of blood transfusion and the use of blood plasma both in the United States and abroad.*

L. Le Bron Alexander, M.D., Rossville, Ga.

Answer.—The first authentic experimental blood transfusion was done by Richard Lower of Cornwall in 1666. By the use of quills and later silver tubes, he transfused blood from the carotid artery of one dog to the jugular vein of a second dog. The earliest successful human blood transfusion was accomplished by Jean Baptiste Denis, physician to King Louis XIV, in 1667. He injected 9 oz. of blood taken from the carotid artery of a lamb into the vein of a young man who was exsanguinated from numerous venesections. Scientific blood transfusion, however, began with James Blundell at St. Thomas Hospital in London in 1818; he had observed a woman die of uterine hemorrhage. He recorded his findings in his "Physiological Observations and Experiments" in 1824. In the United States, George Crile succeeded in 1907 in transfusion of blood from one person to another by the use of a cannula, one end of which was tied to the artery and the other end to the vein. In 1871 Bowditch and in 1872 Luciani used plasma and serum experimentally. In 1918 G. R. Wood, a captain in the British Army, recommended the use of citrated plasma in the treatment of emergencies in clearing stations and pointed out its advantages over whole blood. Max Strumia of Philadelphia put citrated blood plasma into routine use at the Bryn Mawr Hospital in 1927. J. Elliott of Salisbury, N. C., popularized plasma administration in 1936. Strumia employed dried plasma in 1938, and the British workers Edwards, Kay, and Davie used it in 1940.

References

Crile, G. W.: Technique of Direct Transfusion of Blood, Ann. Surg. **46:**329, 1907.

Blundell, J.: Observations on Transfusion of Blood, Lancet **2:**321, 1828.

Edwards, F. R.; Kay, J.; and Davie, T. B.: Preparation and Use of Dried Plasma for Transfusion, Brit. M. J. **1:**377-381 (March 9) 1940.

Transfusion of Blood and of Blood Substitutes, editorial, J. A. M. A. **117:**1627-1629 (Nov. 8) 1941.

Elliott, J.: Preliminary Report of New Method of Blood Transfusion, South. Med. & Surg. **98:**643-645 (Dec.) 1936.

Ficarra, B. J.: Essays on Historical Medicine, New York, Froben Press, Inc., 1948.

Strumia, M. M., and McGraw, J. J.: Development of Plasma Preparations for Transfusions, Ann. Int. Med. **15:**80-88 (July) 1941.

Zimmerman, L. M., and Howell, K. M.: History of Blood Transfusion, Ann. M. Hist. **4:**415-433 (Sept.) 1932.

CHRONIC LYMPHEDEMA OF THE ARM

To the Editor:—*Please give suggestions as to the management of chronic lymphedema of the left arm. A patient had a radical breast amputation 15 years ago. Since then, the arm has been swollen and has shown nonpitting induration, which is symptomless, except for the arm being heavy. However, over the past years she has had frequent episodes of high fever, chills, redness, swelling, and more induration of the arm. This is brought on usually by overusage of the arm, associated with extreme fatigue. Usually one or two injections of penicillin seems to hasten resolution, which requires about 48 to 72 hours.*

E. L. Petry, M.D., Kansas City, Mo.

Answer.—Chronic lymphedema of the arm after radical mastectomy is managed by vertical suspension of the arm with use of an overhanging sling. The sling supports the arm loosely at the wrist. Such a patient should be hospitalized and placed at bed rest for 10 days. Usually, within 10 days, the edema disappears. The arm is then measured for an elastic sleeve from the wrist to the axilla. The patient may remove the sleeve only on retiring but must place the arm on two pillows when at bed rest. The patient is instructed to utilize her sitting time for vertical arm elevation. This is achieved by constructing a sling fastened to a wall or to a floor lamp near the patient's chair. The sling should provide a nearly vertical position for the arm. In this manner, time spent in viewing television or in reading is simultaneously utilized for an effective therapy. If, in spite of these measures, the edema gradually recurs, the hospital regimen may have to be repeated once or twice a year. The results of the therapy depend on the etiology of the edema. The usual causes are a compromise of venous and lymphatic drainage at operation, postoperative wound infection, postoperative x-ray therapy, or carcinomatous involvement of the axilla. It is stated that the lymphedema occurred after the radical mastectomy 15 years ago. The extent of the time alone would rule out metastatic invasion. Since postoperative x-ray therapy is not mentioned, one may postulate that the genesis of this particular edema is due either to a venous compromise at surgery or to postoperative wound infection with subsequent fibrosis. A release of venous occlusion may occasionally be secured by a Z-plasty in the fibrotic area. This is hazardous, because the axillary vein is imbedded in the fibrous tissue and an injury to this vein could be disastrous.

MENIÈRE'S DISEASE

To the Editor:—*In 1957, a 66-year-old man suffered an acute, incomplete loss of hearing in his left ear, with tinnitus and a feeling of fulness. It was diagnosed as a hydrops cochleae and disappeared within a few days. It reappeared a few months later for only two days. After the attacks, his hearing was in no way impaired. In January, 1958, a mild case of influenza with pharyngitis and blockage of the Eustachian tubes turned into another attack of hydrops. In the beginning, there was again lowered acuity of hearing and tinnitus but also a terrific pressure in the left side of the head which came to a crisis with an attack of vertigo, without nausea or vomiting. No dizziness had occurred before. The pressure disappeared, but the incomplete loss of hearing and the tinnitus persisted. Only once, a few months later, has another severe attack of vertigo occurred. No therapy has helped. Nicotinic acid in a dosage large enough to flush the face caused only a subconjunctival hemorrhage. Antihistamines give rise to bladder trouble by causing slight ischuria. Please give suggestions for treatment.*

M.D., New York

Answer.—The history is entirely consistent with Menière's disease or, as it is now commonly called, endolymphatic hydrops. The pathology is known to be an increase in the amount of endolymphatic fluid within the labyrinth, but the reason for the increase is unknown. The low salt diet of Furstenberg, combined with potassium chloride or ammonium chloride, is helpful in some cases. Nicotinic acid has been helpful in a few cases. Occasionally, a diuretic helps to control the symptoms. One of the most successful medical treatments has been the use of extremely dilute histamine according to the method of Hansel. Recently, good results have been reported by the correction of an endocrine disturbance, most often of thyroid metabolism. Unfortunately, there remains a considerable number of cases in which medical treatment fails to control the symptoms. For these, destruction of the labyrinth may be necessary should there be continued attacks of incapacitating vertigo. The medical treatment of this condition is described by Derlacki (*Laryngoscope* 64:271, 1954).

HYPERTHYROIDISM

To the Editor:—*A patient, aged 70, has an elevated protein-bound iodine level and basal metabolism rate, with typical symptoms of hyperthyroidism (e. g., increased perspiration, loss of weight, and mild diarrhea). In addition, she has auricular fibrillation and a nodule about the size of a small marble. What would be the best treatment for her? Would surgical or medical treatment be advisable?*

Milton Sheiman, M.D., Bridgeport, Conn.

Answer.—This case presents several problems. It would be of some importance to know whether the hyperthyroidism results from toxic diffuse goiter (Grave's disease) or from hyperfunction of the nodule. In view of the small size of the nodule, the latter condition is unlikely but not entirely excluded. Radioiodine (I^{131}) studies, particularly with the gammagraph, should answer that question. Unsuspected malignant disease is present in about 5% of patients with nodular enlargements of the thyroid, and a "hot," or functioning, nodule is considerably less likely to be the seat of malignancy than a "cold" one. Except for the presence of the nodule, and assuming adequate collection of I^{131} by the thyroid gland, I^{131} would offer the most conservative treatment of hyperthyroidism in a person 70 years of age, and, in the absence of any clinical suggestion of cancer, treatment by this means would be justified in a patient at that age in spite of the presence of the small nodule. In this event, however, subsequent growth of the nodule would be adequate reason for prompt surgical intervention. If the patient is not debilitated and is in good general health, partial thyroidectomy, after proper preparation, should carry only minimal risk and would also be a justifiable method of treatment. The choice of either of the proposed forms of treatment is sufficiently equivocal in the instance cited so that neither could be urged too strongly in preference to the other.

ACTION OF ACTH IN ASTHMA

To the Editor:—*In the treatment of status asthmaticus, what is the pharmacological and physiological effect of ACTH? Is its effect accomplished by its action on the adrenal gland?* *M.D., Illinois.*

Answer.—The effect of ACTH in the doses necessary for the treatment of status asthmaticus is more accurately termed pharmacological rather than physiological. ACTH stimulates the activity of the adrenals to an excessive production of corticosteroid hormones related to hydrocortisone. The effect of these hormones on tissue is generally called "anti-inflammatory." In asthma, as in all allergy characterized by a wheal type (immediate) of skin reaction, the effect of the high concentration of these hormones is to decrease the edema of the tissue, restoring it to a nearly "normal" (nonallergic) state, with the resultant relief in symptoms. According to Rappaport and his co-workers (*A. M. A. Arch. Path.* 60:1, 1955; *J. Allergy* 24:35, 1953), the reduction of the edema is due to the effect of the hormones on the interstitial cement, usually termed ground substance, and on the perivascular sheaths. The ground substance is in a semifluid state during the allergic reaction. The perivascular sheaths are thinned, increasing the tendency to loss of fluid from the vessels. These factors favor edema of the allergic tissue. The increase in adrenal secretions after ACTH administration results in a change to a less fluid state of the ground substance and in a restoration in the normal thickness of the perivascular sheaths. These may be the important changes which result in lessened edema in this type of allergy, with resulting relief in symptoms.

VITAMIN B_{12} FOR PERNICIOUS ANEMIA

To the Editor:—*About two years ago, a woman, aged 70, noticed a feeling of pins and needles and numbness in her hands and feet; in June, 1957, she showed a typical blood picture of pernicious anemia. Cyanocobalamin, 100 mcg., was given daily for a time and then about every two weeks. Her blood and nervous conditions have much improved. What dosage of vitamin B_{12} should be necessary from now on? Has the insufflation method of administrating vitamin B_{12} proved satisfactory? Should any additional treatment be given?* *M.D., Alberta, Canada.*

Answer.—Experimentally, it has been determined that 30 mcg. of vitamin B_{12}, given once monthly, is adequate maintenance therapy in pernicious anemia after it has been brought under control. Normal serum vitamin B_{12} levels will result from this dosage schedule. In the opinion of most workers in this field, the insufflation method of administration is not a wise route in the average patient, even though, obviously, absorption takes place by this route. The method will be satisfactory for some, but most workers feel that it should not be used if neurological findings are present and, certainly, the method has not been widely adopted. Parenteral route of administration for vitamin B_{12} seems the most logical at the present time and preferable to administration either by insufflation or by the oral route. Some neurological improvement can occur up to two years after administration of therapy, so that it has been standard practice to administer 3 mcg. as often as once weekly until maximum improvement has occurred, after which time 30 mcg. every three to four weeks would be adequate treatment.

PRENATAL FETAL ELECTROCARDIOGRAM

To the Editor:—*Is there any way to record the electrocardiogram of the unborn human fetus in utero during the sixth or seventh month of pregnancy?*

Albert Abraham, M.D., Morristown, N. J.

Answer.—E. M. Southern (*Am. J. Obst. & Gynec.* 73:233, 1957) mentions that Easby in 1934 reported an electrocardiogram obtained from a 4½-month-old fetus. Marcel and Exchaquet (*Arch. mal. cœur* 34:39, 1941) took leads directly from the exposed heart of a 6-mm. human embryo and showed concordant QRS and T deflections. Raiha (*Acta pædiat.* 18:440, 1936) examined the electrocardiograms of 45 premature fetuses weighing from 1,000 to 2,500 Gm. (2 to 5½ lb.) and indicated that electrocardiographic complexes were recordable directly during embryonic life and followed a characteristic pattern. Southern studied the fetal electrocardiograms in 96 cases. The apparatus he used comprised a vector system with two amplifier channels, a lead selector system with facilities for both connections, and an oscilloscope for visual display of the leads selected. The technique is fully described in the article.

ENURESIS

To the Editor:—*Please give information concerning the water treatment of enuresis.*

Burton A. Finne, M.D., Chicago.

Answer.—It is not clear what is meant by "water treatment of enuresis." It is presumed that the questioner refers to the practice of restricting fluid intake, particularly in the evening, for the child who is suffering from nocturnal enuresis. This approach, and also that of feeding salty foods which would retain the fluids, has been found ineffectual. Nocturnal enuresis in a child above the age of 3 years, provided organic factors (which are rare) have been ruled out, is considered a psychosomatic reaction due to inadequate and faulty training or anxiety. The modern approach is not to restrict fluids in any form at any time but to reassure the child, particularly prior to bedtime. In persistent cases, a detailed study of the family and a psychiatric investigation of the child is indicated to uncover the causes of anxiety which may not be too apparent. The parent must be careful not to take a punitive attitude towards the enuresis but to commend the child for the nights that he does not wet the bed. In some cases, calmly waking the child and taking him to the bathroom helps.

LIFE SPAN AFTER SPLENECTOMY

To the Editor:—*Would there be any alteration in life span or any physiological alterations that are permanent after a splenectomy from a traumatic injury in a child 14 years of age?*

Thomas J. O'Brien, M.D., Buffalo.

Answer.—As a rule, no characteristic change in the life span or general physiology may be expected after removal of a normal spleen because of trauma. Under ordinary circumstances, the hemolymph glands in the abdomen take on the character and most of the functions of the spleen. If the spleen is removed because of disease, the underlying condition may affect the outcome. Certain blood changes appear after splenectomy, some compensatory and others associated with the absence of the spleen cells. According to some, there is an increased susceptibility to infection after splenectomy. No increase in the formation of malignant tumors has been reported. Some individuals have noted ease of exhaustion and other nonspecific symptions. On theoretical grounds, one would expect a disturbance in the portal tension and also a lack of immediate red blood cell compensation at high altitudes or during nonpressurized airplane flights.

ALOPECIA UNIVERSALIS

To the Editor:—*A woman, aged 33, started losing the hair on her head in spots, as in alopecia areata, and over a period of five months lost all her hair, including eyebrow and pubic hair. Along with this, her fingernails became brittle. Previous treatment has included vitamin B_{12} and thyroid. Please suggest tests which might show the source of this condition. Is there any treatment? What is the prognosis?*

B. R. Farner, M.D., Norfolk, Neb.

Answer.—The patient described has the manifestations of alopecia universalis. The diagnosis can be made only by examination. There are no tests which are specific for the condition. Other than for occasional nail changes, there are no other systemic manifestations which regularly accompany this condition. Treatments usually consist of the use of a mild stimulant applied to the affected areas. Some physicians use thyroid when it is not contraindicated by other conditions. With widespread alopecia, the prognosis of hair regrowth is not as good as for a localized patch. Some patients will show complete regrowth.

PROGRESSIVE MYOPIA

To the Editor:—*A 9-year-old boy has a family history of three generations of low grade (-1.00 sphere) myopia. He has multiple allergies, slight exophthalmos, and myopia. This has progressed from -0.50 sphere in February, 1957, to -1.00 sphere in March, 1958, and to -1.50 sphere in August, 1958. With -0.25 cylinder, his vision is 20/20. Could a thyroid disorder or the allergies be a causative factor for 100% increase of myopic spheres in 18 months?*

C. A. Campbell, M.D., Philadelphia.

Answer.—The gradual increase in myopia is neither unusual nor a cause for alarm. There is no connection between it and an allergic state or thyroid malfunction. The child should be tested once a year and his glasses changed as needed, but he should not be made an "eye invalid" by too much and too frequent examinations. Of course, it is understood that he has been instructed in using correct light coming from his left side, in keeping his close work at the proper distance, and in all the other well-established rules for the preservation of sight.

FOAMING OF THE URINE

To the Editor:—*What substances other than bile salts and bile pigments will lower the surface tension of the urine and produce foaming?*

Jack M. Troy, M.D., Hammond, Ind.

Answer.—For the most part, foaming in urine is caused by the presence of lyophilic sols, whether they increase or decrease surface tension. If they produce an appreciable change, they greatly facilitate the formation of foam. Thus, the chief cause of foaming in urine is the presence of proteins, mucoproteins, and mucin. It should be remembered that the urinary antiseptic agent, phenylazodiaminopyridine, a lyophilic azo dye, produces a yellow foam in urine not unlike that produced by bile pigments.

URTICARIAL RESPONSE TO TRAUMA

To the Editor:—*What is the cause of urticaria that occurs immediately after slight trauma? Is there any treatment? The patient is not allergic to anything.*

E. C. Kunde, M.D., Marengo, Ill.

Answer.—The ultimate cause of immediate urticarial reactions to slight trauma is not known. The precipitating cause is probably that such persons have a more labile histamine release mechanism, but why they should have a more labile histamine release system is not known. The problem has been discussed by Lorincz in the second chapter of the book "Allergic Dermatoses Due to Physical Agents" (edited by Baer, Philadelphia, J. B. Lippincott Company, 1956). The condition is difficult to treat. Antihistaminics are often of value in temporarily suppressing the lesions, but their use may have to be continued more or less indefinitely.

ACRYLIC LENS OPERATION

To the Editor:—*What is the current opinion in America on the operation in which an acrylic lens is substituted for the natural one?*

William Eldon, M.D., Mudeford, Hampshire, England.

Answer.—The acrylic lens operation of Ridley was never particularly popular in the United States and has been virtually discarded even by the early proponents. Briefly, the operation was associated with formidable complications and, occasionally, with loss of the eye. However, the procedure did prompt the development of the numerous types of anterior chamber lenses now available, and these appear likely to be quite popular.

DRUGS CONTRAINDICATED IN GLAUCOMA

To the Editor:—*What drugs, besides belladonna derivatives, are contraindicated in glaucoma or increased intraocular tension? Is chloroquine phosphate contraindicated?*

Marks S. Shaine, M.D., New York.

Answer.—The drugs chiefly contraindicated in glaucoma are atropine and its various derivatives or, in general, the cholinergic blocking agents. Chloroquine phosphate is not contraindicated in glaucoma. It is an antimalarial, and the blurring of vision which it may cause in high doses is part of its quinine-like action.

ALUMINUM HYDROXIDE AND DIETARY PHOSPHORUS

To the Editor:—*In reference to the question and answer on aluminum hydroxide and dietary phosphorus, which appeared in* The Journal, *Aug. 9, 1958, page 1904, it should be noted that another aluminum compound, basic aluminum carbonate, is described in "New and Nonofficial Drugs" (Council on Drugs of the American Medical Association, Philadelphia, J. B. Lippincott Company, 1958) as one-third more effective than aluminum hydroxide gel in phosphorus-binding power. Both of these drugs combine with the phosphate ion in the intestinal tract to form insoluble aluminum phosphate which is excreted as such in the stool, thus diminishing the amount of phosphate available for intestinal resorption and reducing urinary excretion of phosphate. Aluminum hydroxide gel was used by Freeman and Freeman* (Am. J. Dis. Child. 61:*981, 1941) to reduce the concentration of inorganic phosphorus in the serum of children with chronic ren*[illegible] *with a low phosphorus diet,* [illegible] (J. Urol. 53: *507, 1945) to be effective in the management of urinary phosphatic calculi. In subsequent metabolic studies* (J. A. M. A. 144:*1549-1556 [Dec. 30] 1950), Shorr demonstrated the greater phosphorus-binding capacity of basic aluminum carbonate.*

G. E. Farrar Jr., M.D.
Box 8299
Philadelphia 1.

SWIMMER'S ITCH

To the Editor:—*In the Questions and Answers section in* The Journal, *Aug. 23, 1958, page 2154, the question is raised as to whether swimmer's itch due to cercaria of avian schistosomiasis, as reported from Hawaii, was, or could be, contracted "as the result of swimming off the coast of Hawaii." As pathologist at Hilo Memorial Hospital, Hilo, Hawaii, in 1949, I saw several patients with swimmer's itch due to this cause. Without exception, these cases had been contracted from swimming in fresh water ponds and ditches inland from the ocean. I understand that this trouble also exists on Oahu. The consultant says that recently some type of "swimmer's itch" has been reported from several coastal areas of North America and Hawaii. As far as I know, "swimmer's itch" due to cutaneous cercaria is not contracted by swimming in the ocean.*

John H. Schaefer, M.D.
1525 S. Broadway
Los Angeles.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*The following references are offered to give light on this question: Chu, "First Report of Presence of Dermatitis-Producing Marine Larval Schistosome in Hawaii"* (Science 115:*151, 1952); and Stunkard and Hinchliffe "Avian Blood Flukes Whose Larvae Cause 'Swimmer's Itch' of Ocean Beaches"* (J. Parasitol. 38:*248, 1951).*

DISSOLVING CORNEAL OPACITIES

To the Editor:—*In the question and answer on dissolving corneal opacities in* The Journal, *Sept. 6, 1958, page 138, edathamil calcium-disodium was recommended. This should be edathamil hydrogen-disodium. Literature may be obtained from the drug company that markets this product. It was originally used by the chief of ophthalmology at Harvard Medical School.*

Lewis T. Mann, M.D.
18 E. 84 St.
New York 28.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

National Health Survey Makes Major Report . .

FDA Exempts 118 Chemicals from Testing . .

Flemming For More Rehabilitation of Disabled . .

AFL-CIO Urges Uniform Blood Banks . .

Atomic Energy Grants to Medical Schools . .

NIH Grants During October to $4,200,000 . .

FIRST FULL-YEAR STUDY OF INJURIES AND ILLNESSES COMPLETED

The Public Health Service, with the Census Bureau supplying poll takers, has completed the first full-year study of illnesses and injuries in U. S. families and of the number of physician visits. The sample involved 36,000 households, covering 115,000 persons. From the answers, projections were made and certain conclusions arrived at.

Such surveys will be carried on on a continuing basis as a result of the action of Congress in 1956 in authorizing the U. S. National Health Survey. Surgeon General Burney commented on the first study: "With this first annual summary, the health survey is beginning to produce a comprehensive picture that workers in the health fields have long needed."

According to the survey, illness and injury caused the American people to stay home from work or school, remain in bed, or otherwise cut down on normal activities for about 3.4 billion man-days during the year ending June 30, 1958. This total averages out to 20 days per person per year. Acute illnesses, with respiratory conditions leading the category, totalled 437,900,000, or an average of about 2.6 days per person.

About 47 million persons were injured seriously enough during the year to cause them to restrict their activities for a day or more or seek medical attention, the survey found. The injuries caused 424,100,000 days of restricted activity, or 2.5 days per person.

Under chronic conditions, the PHS listed circulatory diseases as the cause of 484,200,000 days of restricted activity, equivalent to about 2.9 per person. Digestive conditions ranked second and arthritis and rheumatism third.

The survey estimated that about 890 million physician visits (in offices, homes, outpatient clinics, or telephone calls) were made during the 12 months, or an average of 5.3 times per person.

Additional projections under physician visits: 1. More women than men use doctors' services—6.0 visits per person for females as against 4.5 for males. 2. The greatest number of visits occurred during the October-December quarter. 3. About three-fourths of the visits were for diagnosis and treatment, as against such preventive services as examinations and immunizations. 4. About two-thirds of the visits took place in offices. 5. The largest number of home visits were for persons 65 years of age or older.

REGULATIONS DRAWN UP FOR FOOD ADDITIVES CONTROL

An important step toward putting into effect the new federal law governing additives to foods has been taken with preparation by the Food and Drug Administration of a proposed list of 118 chemicals to be exempt from testing requirements.

Under the law, enacted by the last Congress, pretesting of chemicals must satisfy FDA before the substances may be added to foods. However, chemicals that have proved their safety by long usage may be declared exempt from the testing.

FDA's first list of exempt chemicals includes 61 preservatives, 29 buffers and neutralizers, 35 nutrients (such as vitamins, minerals, and amino acids), 5 nonnutritive sweeteners, 5 coloring agents, 5 stabilizers, 4 emulsifiers, and 34 other additives of various types. Thirty-six of the 118 are limited as to the quantity that may be used or the foods in which they may be used.

No flavoring materials are included in this list; they will be dealt with later. Coal-tar colors are subject to a different provision of the Food, Drug, and Cosmetic Act.

Complete text of the proposed regulations, including the list of the exempt chemicals, will be available after publication in the Federal Register. The list is not complete, FDA explains, as from time to time qualified experts will agree on other additives that are not a threat to health.

Publication of the list will allow qualified authorities to give the FDA their views as to whether further testing of the substances will be necessary. After the regulations and initial list are published in the Federal Register, 30 days will be allowed for the filing of suggested changes, deletions, or additions.

FDA has not specified in detail the type of scientific studies that must be made to determine safety of a nonexempt substance. Evaluation of test data will be based on criteria established by the food protection committee of the National Research Council, "unless equally good or better methods are proposed by the manufacturer."

A petition to have a food additive accepted must include a complete history of the substance, its composition, source, stability data, proposed quantity and method of use, control procedures, and appropriate tests to determine the amount of the additive in the finished food. Full information also must be furnished on any animal or other biological experiments designed to establish safety of the additive.

After a petition has been filed, notice to that effect will be published in the Federal Register. Subsequently, the regulation will be issued, giving the quantity of the additive to be used and the foods in which it may be used.

SECRETARY FLEMMING URGES MORE REHABILITATION EFFORTS

Addressing the Social Security Administration's medical advisory committee, Secretary Flemming of the Department of Health, Education, and Welfare stressed the importance of an increased effort to bring about the rehabilitation of disabled persons.

The Secretary said his department is putting more emphasis on medical research into disability, adding that "disability evaluation is not a static process but must keep pace with medical progress."

Mr. Flemming pointed out that the present disability payments section of the social security law, which offers OASI retirement benefits to persons 50 years and older who because of illness or injury are unable to do "any substantial gainful work," provides an ideal opportunity for channeling the disabled to state or other agencies where they may benefit from rehabilitation services.

The committee advises Social Security Administration on all phases of the disability program. Secretary Flemming praised it for developing, with the cooperation of the medical professions, "a sound and workable method of determining disability." He said this "difficult task" has been accomplished in a way "which does not interfere with doctor-patient relationships."

A person applying for disability benefits, or disability freeze protection (under which his Social Security benefits are not reduced because of years of forced unemployment), is directed first to consult a physician. The physician reports clinical findings, based on medical tests and laboratory examinations, after which a team, including at least one physician, decides whether the applicant qualifies as "disabled."

Dr. J. Duffy Hancock, professor of surgery at the University of Louisville School of Medicine, is chairman of the advisory committee.

AFL-CIO WANTS NATIONWIDE, UNIFORM, VOLUNTARY BLOOD BANK SYSTEM

The AFL-CIO wants all blood bank activities coordinated under a nationwide "uniform voluntary system."

Support for such a program was pledged by the labor organization's executive council at a meeting in Washington. It acted on a recommendation of the AFL-CIO's community services committee.

The council declared: "The AFL-CIO shall take appropriate steps to offer the full cooperation and active participation of organized labor to the Joint Blood Council and its cooperating agencies in the development and maintenance of a national blood program."

The Joint Council is made up of the American Medical Association, the American Hospital Association, the American Society of Clinical Pathologists, the American National Red Cross, and the American Association of Blood Banks. Its headquarters is in Washington, D. C., and the executive vice-president is Dr. Frank E. Wilson.

In the national blood organization, the AFL-CIO wants a uniform, voluntary system of blood banks, the requirement of uniform licensing standards, and a national clearing house or exchange for blood and blood credits.

AEC AWARDS $326,510 IN GRANTS: MEDICAL SCHOOLS BENEFIT

Atomic Energy Commission has approved $326,510 in grants to 30 colleges and universities, including 11 medical and public health schools, to help in buying training equipment.

Since start of the program in 1957, it has distributed almost $1,500,000 "for the purpose of helping colleges and universities expand their facilities for training in radiation biology and in the use of radioisotopes in the fields of agriculture, veterinary medicine, medicine and pharmacy, public health, and biology."

Another series of grants will be announced in the early spring of 1959. For information as to possibilities and requirements, write the director, division of biology and medicine, U. S. Atomic Energy Commission, Washington 25, D. C.

Largest grant ($25,000) went to the University of Minnesota School of Public Health. Minnesota's medical school also received $9,000. Other medical and public health schools to benefit were Albany Medical College of Union University, Boston University School of Medicine, University of California Medical Center at San Francisco, Indiana University School of Medicine, University of Puerto Rico School of Medicine, Temple Medical Center at Philadelphia, Southwestern Medical School at the University of Texas, Albert Einstein College of Medicine in New York, and University of Washington School of Public Health.

NIH RELEASES $4,200,000 IN GRANTS AND FELLOWSHIPS

During October, the last month for which complete information is available, the National Institutes of Health released a total of $4,200,000 in research grants and fellowships. Fellowships, valued at $603,344, went to 157 individuals, and $3,600,000 was given for 266 research grants.

Of the 266 research project grants, 86 (worth $641,615) went for new projects, more than half of them in arthritis, metabolic diseases, and mental health.

Highest institute total was $912,156 from the Heart Institute for 47 research projects. Other research totals by institutes were cancer $193,643, allergy and infectious diseases $268,528, arthritis and metabolic diseases $889,347, dental $44,800, mental $217,103, neurology and blindness $505,071, and general medical sciences $703,529.

THE JOURNAL
OF THE
American Medical Association
Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 14
CHICAGO, ILLINOIS
DECEMBER 6, 1958

Copyright, 1958, by American Medical Association

MEPROBAMATE ADDICTION

Linn J. Boyd, M.D., Leonard Cammer, M.D., Michael G. Mulinos, M.D., Victor F. Huppert, M.D.
and
Harvey Hammer, A.B., New York

A STUDY OF THE long-term administration of meprobamate (Miltown) was undertaken, with special attention to symptoms observed on sudden withdrawal of the medication. This approach was used because meprobamate is commonly prescribed for daily use over long periods, because such chronic administration of drugs acting on the central nervous system may induce dependence, and because few well-controlled series of observations had been made with meprobamate as the sole medicament.

Despite prolonged use of clinically effective doses of meprobamate, no evidence of dependence, physical or psychic, manifested itself on sudden withdrawal of the drug and substitution of a placebo. The patients studied were elderly, and their reactions to central nervous system depressants were expected to be somewhat exaggerated. Dependence or habituation is not predicated solely on the prolonged administration of clinically effective doses. The personality of the subject, his previous drug history, and the size of the dose are important deciding factors in the development of addiction. The elimination of excessive anxiety, insomnia, or depression may be considered as a proper indication for the use of either stimulants or depressants. However, the sense of well-being engendered by these drugs may lead to their use far beyond the period necessary for the obtaining of symptomatic relief.

Plan of Study

With use of a double-blind technique, 90 patients, equally divided as to sex, were chosen from four wards at Bird S. Coler Hospital; 30 male and 30 female patients each received a capsule containing 400 mg. of meprobamate three times a day, and 15 male and 15 female patients were given a placebo capsule, physically indistinguishable from the meprobamate capsule. Each of the four groups was contained in a separate ward.

The subjects selected for this study were elderly patients, most of them ambulant, with common geriatric problems, who had been hospitalized primarily for custodial care. Their daily behavioral patterns, sleeping and eating habits, and emotional make-ups were well established and known to the nurses and attendants, making even minor deviations in reactions quickly recognizable.

Prior to the start of the study, each patient's personal history was reviewed thoroughly, psychiatric and neurological examinations were made in order to establish a norm for each patient, and eating and

---

From the departments of medicine, psychiatry, and physiology and pharmacology, New York Medical College.

sleeping habits and daily behavioral patterns were approximately quantitated and recorded. All untoward symptoms reported by the patients or any signs observed by the attendants were recorded daily, regardless of their apparent connection with the medication. Where occasional side-effects were severe enough to suggest an association with the medication, placebos were substituted for the meprobamate. After a short period of time, it was usually possible to resume medication. In addition, all previous medication affecting sleep or central nervous system functions was discontinued, and the patient reassured as to the significance of the change. Except for these preliminary steps, each patient pursued his regular routine and was given no indication that a special study was being conducted.

At the end of an eight-week period in preparation for the observance of any withdrawal symptoms, the meprobamate group was switched to the placebo for an additional two weeks. This step eliminated possible psychological disturbances referable to a change in the medication or to its abrupt discontinuance. The placebo group, comparable to the test group as to age, sex, environmental distribution, and previous medical status, was treated concomitantly for 10 weeks without interruption.

Table 1.—*Comparative Data on All Subjects in Meprobamate Habituation Study*

		Vital Statistics								Disease, No.		
					Weight, Lb.							
			Age, Yr.		Initial		Final					
Treatment*	No. of Patients	Sex	Av.	Range	Av.	Range	Av.	Range	Senile Cardiovascular	Skeletal†	Other
M-P	30	M	74	51-88	152	92-204	148	89-199	19	5	6
M-P	30	F	76	56-95	137	91-293	135	90-285	15	9	6
P	15	M	74	54-86	145	92-186	143	92-186	7	5	3
P	14	F	63	48-92	132	101-207	133	103-207	11	1	2

* M-P = meprobamate for eight weeks, followed without interruption by placebo for two weeks. P = placebo alone for 10 weeks.
† Includes fractures, osteoarthritis.

Results

The data are summarized in the tables. Because the patients were elderly (average age 75, table 1), their reactions to central nervous system depressants were expected to be somewhat exaggerated, and for this reason a close watch was kept for reactions due to overdosage, such as dizziness, somnolence, staggering, and falling. (It may here be emphasized that these patients had not presented symptomatic indications requiring medication of the type represented by meprobamate.)

It is seen from table 1 that more than half of the patients had cardiovascular disorders associated with senility, while about one-quarter suffered from skeletal defects, most of which were fractures, presumably due to previous falls. The conditions of the remainder had been diagnosed as follows: diabetes (1), multiple sclerosis (2), herniorrhaphy (2), paralysis agitans (3), cerebral complications (3), and miscellaneous benign conditions or operations (5).

Side-effects.—Table 2 shows the various complaints or medical conditions reported or observed during the study. These data were obtained from the nurses' detailed notes and from questions asked of the staff and patients by the responsible physician. Because there was no way of determining accurately the origin of the symptoms, these were recorded without regard to any apparent cause. It was felt that, in a double-blind, controlled study such as this, symptoms not specifically due to the medication would occur with equal frequency in both the meprobamate and the placebo groups.

It is evident that the percentile amount of complaints was about the same in all groups, if we do not include the symptoms induced by the pharmacological activity of meprobamate (depression of the central nervous system). Gastrointestinal upsets were about the same in the treated and untreated groups. Rashes appeared in four patients of the treated group; one case was diagnosed as a possible drug reaction by the consulting dermatologist. Rashes also appeared in four cases of the placebo group. All rashes disappeared spontaneously, without discontinuance of treatment.

Table 2.—*Summary of Complaints and Reactions in Meprobamate Habituation Study**

			Type of Complaint‡					Total	
Treatment†	Sex	No. of Patients	GI	Rash	CNS	Falls§	Other	No.	%
M-P	M	30	3	3	6	6	7	15	50
M-P	F	30	8	1	7	5	6	17	57
P	M	15	4	4	1	0	1	9	60
P	F	14	1	0	4	1	5	10	66
Totals ..			16	8	18	12	19	51	57

* Exclusive of increase in diurnal dozing or drowsiness. No patients had withdrawal symptoms.
† M-P = meprobamate, eight weeks; placebo, two weeks. P = placebo, 10 weeks.
‡ Some patients had symptoms in more than one category.
§ Three of these patients stumbled and fell before treatment with meprobamate or placebo.

Symptoms referable to the central nervous system are shown in table 2. These were dizziness, headache, mental confusion, increased nervousness, fussing, crying, and others. The other symptoms, too numerous and minor to mention, occurred about equally in the two groups. The number of falls recorded was greater in the treated than in the untreated group. This was interpreted as being due, in large part, to an overdosage reaction to the meprobamate and as indicating that the daily dose of 1,200 mg. was having its full effects. Of 11 patients in the meprobamate group for whom falls were recorded, two had had falls previously. Three of the remaining nine patients fell only once, despite continued medication; therefore, these falls were considered as accidental. One other patient fell again two weeks after discontinuance of therapy, suggesting that the fall could be only casually related to the medication. For these reasons, it is felt that only 5 of the 11 patients who fell while receiving meprobamate did so because of the central nervous system effects of the drug.

Behavior and Sleep Patterns.—The data summarized in table 3 are indicative of the proper pharmacological action of meprobamate as a central nervous system depressant. It appears that the meprobamate regimen did not interfere with appetite or increase inordinately the daytime dozing and drowsiness normally displayed by many of these elderly patients.

TABLE 3.—*Diurnal Behavior and Sleep Patterns During Meprobamate Habituation Study*

			Diurnal Behavior					Sleep Patterns			
			Appetite, No.†					Improved		No Change, No.†	
Treatment*	Sex	No. of Patients	G	F	P	Increased Dozing, No.	Increased Drowsiness, No.	No.	%	G	P
M-P	M	30	20	9	1	13	14	17	57	12	1
M-P	F	30	16	6	8	10	15	18	60	8	4
P	M	15	13	0	2	5	2	3	20	11	1
P	F	14	8	5	1	3	2	4	29	8	2

* M-P=meprobamate, eight weeks; placebo, two weeks. P=placebo, 10 weeks.

† G=good; F=fair; P=poor.

Sixty-four per cent of the patients receiving meprobamate reported that they slept better at night, compared to an improvement of only 28% in the placebo group.

Withdrawal Symptoms.—There were two patients, one man and one woman, whose temporary restlessness after meprobamate medication was stopped was such that it might possibly be ascribed to withdrawal of the medicament. However, during the study, such symptoms occurred in both the placebo and meprobamate groups. Obviously, withdrawal symptoms would not occur in the placebo group.

The actual "interpretation" of the symptoms was made from the data charts submitted for analysis and with full knowledge of the identity of the groups. It was deemed desirable to allow this slight adverse bias, because the burden of proof regarding lack of development of dependency would rest with the meprobamate medication. It is here stressed again that the purpose of this investigation was a search for the occurrence of symptoms pointing to the establishment of dependency. The patient had no way of knowing that the drug had been stopped and, therefore, was spared the ordinary "fuss and bother" symptoms likely to occur whenever chronically administered medication is suddenly withdrawn. The histories of the two patients whose symptoms could possibly be interpreted as due to withdrawal of the drug are reviewed here.

Report of Cases

CASE 1.—An alert man, aged 74, weighing 161 lb. (73 kg.), was hospitalized because of a fracture of the neck of the femur. He was ambulant, and he ate and slept well. His blood pressure was 120/80 mm. Hg, and it remained unchanged during the period of observation. Prior to taking the test dosage of meprobamate, he had been receiving APC tablets for pain in his hip.

During meprobamate therapy, his appetite continued to be good and he slept better at night, with some increase in diurnal drowsiness and dozing. After two weeks of treatment, he developed a low-grade fever and muscle aches and a diagnosis of virus infection was made. He appeared tired and weak; meprobamate therapy was discontinued. The next day, while trying to get out of bed, he fell once but sustained no injury. One week after his fever subsided, meprobamate therapy was reinstituted; it was continued for a month. He became progressively depressed, confused, and weak. Meprobamate was again withdrawn, this time only four days prior to its withdrawal in the group as a whole. He remained tired and confused during the first week of receiving the placebo capsules, and during the second week he developed a slight tremor and appeared somewhat depressed. However, his symptoms were not significantly worse than those which appeared in some patients in the placebo group; they are recorded as possibly being in the "withdrawal" category because of the nature of this study.

CASE 2.—A woman, 74 years of age, weighing 151 lb. (68.5 kg.), was hospitalized for custodial care, with a routine diagnosis of arteriosclerotic heart disease. Her initial blood pressure of 182/86 mm. Hg dropped to 158/68 mm. Hg at the end of the study. She was classified as neurotic and a chronic complainer. She had vague gastrointestinal symptoms, abdominal "pains," gas, anorexia, and occasional nausea. Her complaints continued during treatment with meprobamate, but she slept better at night and dozed more during the day.

After the change from meprobamate to the placebo, she continued her complaints but, in addition, stated that she had symptoms of palpitation and "jumpy stomach." In view of her gastrointestinal history, we believe that the nebulous complaints were not withdrawal symptoms but persistence of her previous pattern, possibly aggravated by the fact that she was not given therapy with magnesium trisilicate and aluminum hydroxide (Gelusil) as freely as before because of instructions to discontinue all previous medication. However, in accordance with the purpose of this study, we describe this case in detail as remotely suggesting withdrawal symptoms.

Comment

Many authorities have expressed the view that all drugs which are used therapeutically as central sedatives to promote sleep or to relieve anxiety may be habit-forming. This applies equally to central stimulants or euphoriants. With both types of drug, the essential factor, presumably, is the improvement in the sense of the well-being elicited by such drugs and the patient's desire to continue in this anxiety-free state.

The elimination of excessive anxiety, insomnia, or depression may be considered as a proper indication for the use of these two types of drug. However, the sense of well-being engendered by these drugs may lead to their use far beyond the period necessary for the obtaining of symptomatic relief.

Excessive administration of these drugs may result in physical dependence and the development of addiction,[1] characteristic of the use of barbiturates.[2] However, dependence or habituation is not predicated solely on the prolonged administration of clinically effective doses. The personality of the subject, his previous drug history, and the size of the dose are important deciding factors in the development of addiction.

The Seventh Report of the Expert Committee on Addiction-Producing Drugs of the World Health Organization takes the view that tranquilizers, although widely diverse in their chemical characteristics, must be classed as potentially habit-forming, because of their similar central sedative action. In addition, the occurrence of a characteristic withdrawal syndrome under conditions of excessive use has been regarded as indicative of a type of physical dependence similar to that with barbiturates, so that these drugs should be subjected to national control.

In considering the classification to which meprobamate belongs within the above definitions, much has been made of the clinical observations of Lemere,[1a] to the effect that "a psychological dependency on the drug is also undoubtedly created in certain patients." The ordinary use of meprobamate had led to overdosage in 13 of over 600 patients to whom Lemere administered it. Only in one patient, taking 16 tablets (6,400 mg.) of meprobamate daily for a month, were there severe symptoms (convulsions) from sudden withdrawal. Such doses were very high indeed, and the absence of withdrawal symptoms in the remainder of Lemere's patients who had been on prolonged therapy with effective daily doses may mean that the critical dose level for the development of meprobamate dependency is high and far beyond that used clinically.

In a previous study, Lemere [3] had stated that meprobamate was not habit-forming. It was with further clinical experience [4] that he was led to believe that this was not always the case. This further experience was derived from abuse of the drug by certain patients, but ordinary clinical doses were not implicated. Our data are in complete agreement with his as to the lack of addiction or dependency from ordinary clinical doses of meprobamate.

The findings obtained in our study are consistent with the view that effective daily doses of meprobamate in a group of 60 elderly patients did not result in either habituation or psychic or physical dependence. There was no desire or compulsion to continue to take the drug or to increase the dose, despite the fact that 400 mg. three times a day resulted in symptoms of overdosage and the drug had to be temporarily discontinued in several patients.

However, the virtual lack of symptoms of psychic dependence in this group may have been due to the fact that these patients had no psychic need for the meprobamate in the first place and, therefore, its abrupt withdrawal was not accompanied by the sudden release of neuropsychiatric symptoms in need of sedation. We interpret the lack of withdrawal symptoms as a failure of the meprobamate to induce psychic dependence or a craving for continued medication, in the manner of the barbiturates.

If meprobamate is capable of eliciting these symptoms, it must do so with larger doses given over longer periods, or only in certain individuals. The doses used in this study were evidently well below the critical dosage level described by Fraser for barbiturates, above which definite addiction can occur, but under which "a clinically significant degree of physical dependence" does not take place.

Stough [5] observed two convulsive seizures among 49 patients in the Oklahoma State Prison on abrup withdrawal of meprobamate. His patients were given from 3,200 to 6,400 mg. daily for four week prior to substitution of the meprobamate with placebos. Within 24 to 36 hours after withdrawal of meprobamate, the symptoms of which these patients formerly complained returned. However none showed any compulsive desire to continue the medication.

Later, 39 of these patients, supplemented by 11 new ones, were divided into two equal groups. One group received up to 1,200 mg. daily of meprobamate for five weeks. The second group received a gradually increased dose of meprobamate, until 2,400 mg. daily was being administered during the last two of six weeks of medication. At the end of five weeks, medication was reduced gradually placebos being substituted for the meprobamate. An absence of severe withdrawal symptoms was ascribed to the week-long, gradual withdrawal period, although in our patients, receiving 1,200 mg per day for eight weeks, there was no evidence of symptoms from abrupt withdrawal. However, it would appear desirable to withdraw meprobamate gradually, especially if the dosage is large and the treatment prolonged. Our results are in agreement with Stough's: no true habituation develops from the daily use of meprobamate.

Meprobamate does not have cumulative effects, because it is rapidly excreted or metabolized. As its administration was continued, some patients became more depressed, dozed more frequently, and began to stumble and fall. This suggested that no tolerance developed, but, on the contrary, as Lemere[4] indicated, that continued medication decreased the amounts needed to produce the same reaction.

Similar results were reported by Tucker and Wilensky[1b] during the clinical evaluation of meprobamate therapy in chronic schizophrenic patients. The doses used were large (up to 1,200 mg. three times a day) but elicited no inordinate depression, dozing, stumbling, or other side-effects, except for some transient gastric distress. On abrupt withdrawal of the drug, solitary grand mal seizures occurred in two of their patients. This, as well as other less serious signs of withdrawal, led them to suggest the need for gradual reduction of the dosage after the prolonged use of large amounts of the drug.

Summary

A controlled study was undertaken to determine the habit-forming propensities of meprobamate (Miltown). Sixty patients received 400 mg. three times a day, for eight weeks, and 30 patients received a placebo. The patients were elderly, under custodial care at a large city institution, and not in need of this type of medication. They were equally divided as to sex and clinical conditions.

Except for the tranquilizing effects induced by meprobamate and increased sleep and diurnal dozing due to it, there was no difference in the reactions of these patients when compared to those of the placebo controls. Despite prolonged use of clinically effective doses of meprobamate, no evidence of dependence, physical or psychic, manifested itself on sudden withdrawal of the drug and substitution of the placebo.

It is concluded that the dosage of meprobamate given, 400 mg. three time a day for eight weeks, was below any critical level that may be necessary for the development of dependency or addiction. This conclusion is consistent with observations of others that the occasional occurrence of withdrawal symptoms is associated with the use of very large doses of meprobamate and that ordinary clinical doses do not cause habituation.

260 Madison Ave. (16) (Dr. Mulinos).

The meprobamate used in this study was supplied as Miltown through the courtesy of Dr. F. M. Berger of Wallace Laboratories, New Brunswick, N. J.

References

1. (*a*) Lemere, F.: Habit-Forming Properties of Meprobamate, A. M. A. Arch. Neurol. & Psychiat. **76:**205-206 (Aug.) 1956. (*b*) Tucker, K., and Wilensky, H.: Clinical Evaluation of Meprobamate Therapy in Chronic Schizophrenic Population, Am. J. Psychiat. **113:**698-703 (Jan.) 1957.

2. Fraser, H. F.: Addictive Potentialities of Hexamethyleneimines, Fed. Proc. **15:**423 (March) 1956. Fraser, H. F., and others: Minimum Dose of Barbiturates Required to Produce Physical Dependence, ibid. **15:**423 (March) 1956.

3. Lemere, F.: New Tranquilizing Drugs, Northwest Med. **54:**1098-1100 (Oct.) 1955.

4. Lemere, F.: Drug Habituation, Correspondence, J. A. M. A. **160:**1431 (April 21) 1956. Reference 1*a*.

5. Stough, A. R.: Possible Habituating Properties of Meprobamate: Clinical Study in Institutionalized, Highly Susceptible Population, J. A. M. A. **166:**882-888 (Feb. 22) 1958.

THE PROBLEM OF SYPHILIS TODAY.—The disease is by no means eradicated, and physicians and public health officials must be ever alert to the possibility that syphilis may still produce disability, financial ruin, dementia, and death. . . . Rein stated that syphilis is on the rise again. A Public Health Report estimated that 1,921,000 persons in the United States have syphilis requiring treatment. Many states and large cities find their venereal disease appropriations inadequate to permit an effective and progressive program. Of major concern is the fact that high rates for primary, secondary, and early latent syphilis are in the age group of 15 to 19, reaching a peak at the 20- to 24-year group. Rapidly declining rates over the past several years have prompted the optimistic demobilization of venereal disease control forces, reassignments of personnel and reduction of case findings, and reduction of diagnostic and treatment facilities, leaving many areas without means to discover cases or to combat sudden outbreaks. Rein . . . stated that as physicians "we have the diagnostic tools and the therapeutic agents to control and even eradicate syphilis. But we are failing because of our own complacency about the disease, because of neglected educational programs, especially for the teenagers, and because of lack of interest or funds to find and treat the affected persons."—Herman Beerman, M.D., The Problem of Syphilis Today, *A. M. A. Archives of Dermatology,* August, 1958.

OCCUPATIONAL DISEASES–DIAGNOSIS AND PROPER METHOD OF REPORTING

Rutherford T. Johnstone, M.D., Los Angeles

While the reporting of an occupational disease is compulsory in most states, the system presently used leads to an accumulation of morbidity and mortality statistics, the greater portion of which are completely worthless. The diagnosis of an occupational disease is not subjected to the same scrutiny for accuracy as is a communicable disease diagnosis. Its medical, legal, and economic importance has not been sufficiently stressed. The prevention of an occupational disease is becoming increasingly difficult due to the vast number of new chemicals and new processes being introduced into the industrial environment. A partial solution to obtain proper diagnosis and reporting of occupational disease lies in supplanting the present system of allowing a careless brief report. A modified narrative form which would demand concise information regarding the history and the nature of exposure, signs, symptoms, laboratory data, and basis for conclusions is a necessity.

The law requires that the physician report specified communicable diseases to his local health officer. The statistics thus derived approach a high degree of reliability. This is due to the fact that by education and experience the physician learns well the signs and symptoms of those diseases common to the community. Likewise, in reporting a communicable disease a physician is impelled to be accurate in his diagnosis, because (1) he senses the seriousness of his obligation to the law, (2) he fears that an error on his part will force unnecessary restrictions and impositions upon the patient, and (3) an erroneous diagnosis will bring censure and reprimand. A diagnosis of smallpox or diphtheria is not apt to be a careless conjecture.

The reporting of an occupational disease is likewise compulsory in most states. Yet, for reasons to be mentioned, the system presently employed leads to an accumulation of morbidity and mortality statistics, a greater portion of which are completely worthless.

Difficulties in Diagnosis

In general medicine the physician practices within an area of readily accessible knowledge. Even on those occasions when the diagnosis of a clinical entity is initially obscure, obtaining aid is not difficult nor is the source of information distant from a physician's daily contact. In contrast, few physicians have had any formal training in occupational medicine, and actual experience in subsequent years is meager. Likewise, information regarding occupational disease is not readily accessible as it is in general medicine, since the subject matter is rarely found in the journals and textbooks utilized by the average physician. Finally, in making this comparison of disease reporting, cognizance must be given to the fact that the diagnosis of an occupational disease is not subjected to the same scrutiny for accuracy as is a communicable disease diagnosis. Its medical, legal, and economic importance has not been sufficiently stressed.

A further deterrent to accurate occupational disease reporting resides in the antiquated method in vogue. The insurance fraternity and the official agencies have not been realistic in facing the revolutionary changes which have occurred within the industrial environment. The system presently in use originated at the time the first Workman's Compensation Act was passed. At its inception, industrial medicine was concerned almost entirely with the treatment of trauma. Etiology was not a mystery. The cause of industrial trauma almost always wa evident, and liability was rarely contested. To report with accuracy and to estimate the degree o disability required only a minimum of words. A standard report form was conceived by the American Association of Labor Legislation in 1913. Wit only slight variation, it is still adhered to by mos states. Not only is the first examining physician obligated to fill out such a form, but he must do s within a short period of time, usually five days. Th original report goes to the state agency, with copie to the employer and the insurance carrier. The primary value of the short form lies in the fact that i is a handy, quick method of reporting an acciden immediately and thereby setting into action th machinery of compensation.

With the advent of the chemical age in industry an entirely different obligation imposed itself on th medical profession. Workers became exposed t multiple and varied substances, most of which ar potentially toxic. These may cause an illness whic mimics a nonoccupational disease. The etiology i therefore of prime importance. Whenever it i alleged that an illness resulted from an exposure t a toxic substance, it is necessary to identify th offending agent. To do so is a challenge not only t the inexperienced but, very often, to the experience industrial toxicologist.

Read in the Symposium on Occupational Medicine for the Private Practitioner before the Joint Meeting of the Section on Preventive Medicine and the American Academy of Occupational Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

Take, for example, a situation which is usual rather than unusual. A patient confronts his doctor with a statement that his illness is due to an exposure to an industrial chemical, the name of which the patient does not know. If duly diligent, the doctor learns that the alleged offending agent is one bearing a long chemical name which is not familiar to him or that it bears a trade name. His search so far is like a baby's first step—just a feeble beginning. The follow-up, if properly pursued, involves telephone inquiries, correspondence, often a plant survey, search of the literature, and utilization of other areas of information. At this point in the discussion we return to the legal requirements in the short form, namely, that the report be made within five days, presumably with a correct diagnosis. This is rarely possible. In view of the amount of time needed to evaluate an occupational disease claim, official agencies should permit the physician to use the short form merely as a notification of medical investigation. On the short form could be stated "diagnostic procedures in process. A complete report will follow after further investigation."

A perusal of the medical reports sent to the Industrial Accident Commission reveals terse statements purporting to constitute a diagnosis. A few of these, picked at random, are as follows:

"Hepatitis caused by chlorinated hydrocarbons." Here it will be noted that no specific hydrocarbon has been isolated. There is the further inference that all hydrocarbons are hepatotoxic agents, whereas only a few are.

"Polyneuritis from exposure to toxic substance in oil refinery." The number of potentially toxic substances in an oil refinery is considerable. If any one of these is capable of producing a neuritis, it is not named.

"Lead poisoning—fumes from spray gun." No attempt is made here to show evidence that the substance in the spray gun contained lead.

Obviously in the examples just cited we find only conjectural statements—not substantiated diagnoses. From such are occupational disease statistics acquired. For this recognized problem there is no ready solution, but at the conclusion of this paper I will offer a suggestion.

Proper Approach to Diagnosis

At this moment it is obligatory that we consider the primary assignment of this paper, namely, the proper approach to the occupational disease diagnosis. This approach is of special value if the case under Workmen's Compensation is controverted.

History of Present Illness.—Cognizance must be taken of the time interval between the exposure and the onset of symptoms. The asphyxiant gases produce illness or death suddenly, not days or weeks later. This is likewise true of most of the anesthetic or narcotic gases, although with some there may be a secondary delayed involvement of one or more systems. On the other hand, intoxication from such substances as lead or benzene or methyl bromide is usually insidious and ill health from exposure to such may not be evident for weeks or months. The time interval in occupational medicine is somewhat similar to the incubation period recognized in general medicine.

Medical History.—The medical history in occupational disease diagnosis is a part of the clinical case history used in general medicine; however, previously existing systemic diseases may, at times, be aggravated by certain occupational exposures, and this factor deserves careful consideration.

Occupational History.—Most reports are insufficient in the area of occupational history. Ideally, the occupational history would leave no gap between the end of the worker's school years and his present occupation. Accounting for every occupational activity has special importance when one attempts to evaluate the significance of exposure to certain dusts, carcinogens, or aromatic hydrocarbons.

In obtaining the occupational history, the physician must not be deluded by the job title. A recently examined patient illustrates this point. For the past 20 years he had "worked out of" a union hiring hall as a boiler maker. Yet for the six months prior to being examined he was engaged in the reconstruction of a chemical plant and was unwittingly exposed to a toxic vapor. Therefore, regardless of the job title, it is obligatory to determine exactly what the worker did and exactly the chemicals to which he was exposed. Further, as in the general medical examination, an inventory of systems is made and a physical examination done.

Laboratory Studies.—As in general medicine, laboratory tests are made as indicated by signs, symptoms, or physical findings. But correlation of the results with the nature of the alleged exposure requires a knowledge of established facts. For example, an abnormal amount of lead in the urine or whole blood does not occur unless there has been an abnormal absorption of lead regardless of the source. On the other hand, evidence of liver dysfunction does not indicate that an exposure to a chlorinated hydrocarbon is necessarily the cause of the dysfunction. Interpretation of x-rays in cases of pulmonary pathology as related to occupational exposure requires considerable experience and judgment.

Plant Survey.—There are occasions when a survey of the worker's plant environment is essential to the final diagnosis. If the examining physician feels that an adequate plant survey is beyond his experience or competence, he should not omit this procedure from his study of the case. At such times he should call on the industrial hygienist to supply him with the information that he seeks. Failure to do so constitutes one of the major reasons why occupational statistics are so inaccurate. In contrast, utilization of the industrial hygienist contributes to the advancement of preventive medicine in industry.

Reference to the Literature.—Unless one has had formal training or considerable experience in occupational medicine, reference to the literature should be done more often than is customary in general medicine. The literature should be authentic and fairly recent. Observations made decades ago are usually not applicable today, except with a comparatively few diseases. Likewise, the opinions expressed by foreign writers are not always acceptable, since the constituents in the chemicals in use in other countries often vary from those in the United States and hygienic control measures may not be similar.

The Law of Specificity

If the procedures outlined in the previous paragraphs are adequately pursued the examining physician will have provided himself with the kind of information necessary to answer two questions arising out of an industrial exposure. He will have ascertained the nature of the worker's illness and he will have identified the substance alleged to have caused the illness. At this point he must ask himself this vital question: did the identified material cause the illness?

The final opinion reached is expressed in that portion of the narrative form termed "Conclusion" which is similar to that usually found in any medical paper except there are certain additional features. All opinions expressed in this final portion of the report should avoid technical terminology, since it is from this section that interested lay persons reach decisions pertaining to his or their particular function, such as the employer, insurance carrier, attorney, or the Industrial Accident Commission referee.

In arriving at a decision as to whether a given case is or is not an occupational disease, one should engage in a type of mental reasoning which I term the "matching process." Ever since it was laid down by Koch medicine has accepted and applied, whenever possible, the "law of specificity." Despite the generic term under which these are classified and despite having a comparable morphology, we recognize that all bacilli do not produce the same clinical picture or pathology. Equally important is the application of the law of specificity in occupational medicine. A commonly made error is the assumption that the chemicals bearing similar names or having similar formulas give rise to similar toxic reactions. This is because of our unfamiliarity with multiple chemicals used in industry. We readily recognize the difference between wood alcohol and whisky and thereby do not ascribe the same toxicity of methyl alcohol to ethyl alcohol. Neither should we assign the toxicity of tetrachloroethane to tetrachloroethylene or of ethylene chlorhydrin to ethylene dichloride, or as in other sounding similarities which could be cited.

In utilizing the matching process, the physician should ask and answer the following questions:

Is the suspected substance known to have noxious properties, or is it known to be inert? Many substances as they are normally handled in industry are harmless. Numerous metals and alloys as they exist in the so-called cold state are not toxic. Likewise, most dusts are inert.

To what degree has a suspected substance been absorbed? Certain irritants, for instance, affect the mucosa of the upper respiratory tract but are not absorbed to produce systemic reactions. Again, this is true of many of the dusts.

Is the substance under suspicion cumulative, or is it rapidly eliminated from the body? Nearly all of the anesthetic gases, such as carbon tetrachloride or trichloroethylene, are rapidly eliminated. On the other hand, methyl alcohol, methyl bromide, and certain metals, such as lead, are cumulative.

In what classification does the offending agent belong? One must recognize whether the offending agent is an asphyxiant, an irritant, or an anesthetic (narcotic) type of solvent gas. One must distinguish between aliphatic and aromatic substances. One must differentiate inert dusts from those capable of causing a reactive fibrosis.

Did an undue exposure actually occur? There is considerable difference between mere exposure and overexposure. The fact that a toxic substance exists within the worker's environment does not mean that he has absorbed harmful amounts. At times it may be necessary to have measurements of the concentration of the gas or dust in the worker's environment and to compare the results with the recognized maximum allowable concentrations. Likewise, one must take cognizance of those substances capable of producing intoxication after a single undue exposure in contrast to those requiring a prolonged exposure before reaction occurs.

Are the laboratory data confirmatory of intoxication and/or of systemic injury?

The final step in the matching process is the application of the epidemiologic and biostatistical disciplines. In each given case involving an identified etiology, is the entire clinical picture one which time and experience have established for that agent under similar circumstances?

The conclusion of the narrative form should end with the opinion that the condition is or is not of occupational origin. If the physician believes it is due to an industrial exposure, he should state the expected length of temporary disability and indicate the nature of the treatment. Any anticipated permanent disability should be estimated in terms of degree.

Comment

Fundamental to the purpose of the Workmen's Compensation Act is the prevention of accidents or occupational ill-health. This is accomplished to an admirable degree by the health program in industry, which includes safety methods and industrial hygiene measures. However, the prevention of an occupational disease is becoming increasingly difficult due to the vast number of new chemicals and new processes being introduced into the industrial environment. Gathering information regarding the toxic effect of these chemicals, as well as spotting "trouble areas," depends in no minor degree on the accuracy of diagnosis.

Unfortunately, the short form used by the first reporting physician does not lend itself to accuracy in diagnosis. The meager space allotted for answers and the time limitation for "getting the report in" actually motivates a carelessness rarely tolerated in any other phase of medical practice.

A partial solution lies in supplanting the present system with a modified narrative form which would demand concise information regarding the history and the nature of exposure, signs, symptoms, laboratory data, and basis for conclusions. This could be done without engaging in the type of lengthy report described in the body of this paper. If a new, well-designed form were provided and if the intelligence of the questions asked induced an intelligent response, the time consumed would be little more than that now utilized with the present form. Furthermore, a properly constituted form could create interest and stimulate self-education in this phase of medicine.

The plea presented in this paper stems from the realization that for nearly 50 years the equitable administration of the Workmen's Compensation Act has been abused for reasons cited. It is not reasonable to continue to assume that the best minds in organized medicine, the insurance fraternity, and the state agencies cannot find means and methods of correcting to a measurable degree an unwarranted situation.

520 W. Seventh St. (14).

COMPENSATIONS TO THE PHYSICIAN IN OCCUPATIONAL MEDICINE

Elston L. Belknap, M.D., Milwaukee

The physician in occupational medicine is obliged to meet the challenge of the varying demands of industries in which new processes are being introduced every day and the diagnostic horizons are constantly widening. Therapeutic and prophylactic skills must be correspondingly broadened. Frequent visits to the plant and patient attention to employees' complaints result in the gradual accumulation of priceless experience. When the confidence of employees and management has been earned, the physician finds that industry can provide him not only with advantages of economic security but also with the assurance, in many instances, of financial support for a stimulating program of continued medical education and clinical research. Through the study of occupational disease the medical profession can and must contribute to modern industrial society.

"These shops are schools whence one can depart with more precise knowledge." [1] So wrote Ramazzini, an internist, a skilled clinician, and a professor of medicine 250 years ago. Blind at 81 years of age, after 50 years of practice, he died of apoplexy on his way to give a lecture. It seems to me that this is a fitting quotation for a discussion of preventive medicine.

Thirty years of private practice in internal medicine, with consultation and teaching in the field of occupational medicine and also work as a part-time medical director, have led me to review my own experience regarding rewards which industry may offer the physician in occupational medicine and to consider whether these experiences might be of value to younger men who currently consider entering this field.

Compensations to the physician in occupational medicine, in my opinion, are the satisfactions derived from the practice of a wide range of scientific techniques, in situations often requiring the utmost in human understanding. Such practice can also have a firm economic foundation.

We hear a great deal of late about the specialist learning more and more about less and less. In the ever-broadening field of occupational medicine, the consultant must learn more and more about more and more. To demonstrate these varied demands, in one recent month, besides my regular teaching and plant responsibilities, I was called on to make widely divergent diagnostic decisions, based not only on the medical examinations but also on first-hand plant surveys in several different industries.

Read in the Symposium on Occupational Medicine for the Private Practitioner before the Joint Meeting of the Section on Preventive Medicine and the American Academy of Occupational Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

The following five problems presented themselves: (1) evaluation of a possible residual from heavy manganese inhalation which had occurred 10 years previously; (2) consideration of whether asthma could be precipitated by inhaling one or two breaths of trichloroethylene through a lighted cigarette, with alleged resultant inhalation of phosgene; (3) study of a possible precipitation by lead absorption of an attack of severe and nearly fatal familial porphyria supposedly due to skin contact with leaded gasoline and inhalation of such gasoline vapor involved in the filling of gas trucks from large outdoor storage tanks; (4) examination of the case of a hospital physiotherapist who received an electric shock with resultant polyneuritis or causalgia; and (5) review of possibility of lead exposure resulting from an experimental process in the electronics industry. With such widening diagnostic horizons comes the thrill of variety, a reward in itself.

Diagnostic Skills

In occupational medicine, as in every other branch of the art of medicine, diagnostic skills stand preeminent. Added to the searching history necessary for the usual medical study, physicians in occupational medicine have learned from the master Ramazzini to follow up in great detail that simple question, "What is your trade?"

Every occupation followed by the patient must be covered—not just the most recent one—as far back as his very first job. The fact that a new patient in his late 60's was a janitor just prior to his admission to the county hospital may not be the most pertinent statistic. For instance, a patient with terminal pneumonia had worked for several years as a gardener on a large estate, but he had previously worked for 35 years as a deep-rock iron miner in northern Wisconsin. The postmortem examination revealed a far-advanced silicotuberculosis, entirely unsuspected because the patient had been thought of only as a gardener in a wholesome outdoor job.

In another instance, a man died of apparently simple acute pneumonia. Just before the patient's death, an unusually alert resident asked the important question: "What is your trade?" This young physician then rapidly pieced together a story of recent inhalation of cadmium fumes. Because they were not oriented to the subject of occupational medicine, the family physician and the staff of a private hospital had not suspected this before the patient finally came to a large public institution in extremis. Later investigation showed that, a week before death, the man had been instructed by a foreman, ignorant of the fatal potentialities involved, to clean out an old cadmium plating tank by melting off the cadmium residue with an oxy-acetylene burning torch. The fuming temperature of cadmium is about 1,500 F, while the temperature of the torch cutting flame was well over 3,000 F. The fatal pulmonary edema was directly traceable to the alveolar burn resulting from the inhalation of cadmium fumes.

Aside from coping with the large number of deleterious chemical agents in the worker's past and present environment, a physician in industry is charged with the responsibility of recognizing the significance of complaints. There is always the possibility that continued complaints may reveal that the worker has serious underlying psychotic tendencies. Patient attention to such a complaint may also lead to the discovery of a heretofore unsuspected dangerous industrial exposure. For example, I recall a case in which a man complained of serious headaches from working in a pit with his head partly hooded by a large casting as he welded with a carbon dioxide–shielded arc. By air analysis the fact was confirmed that, as admitted by the manufacturer of the machine, such welding equipment may give off a considerable amount of carbon monoxide near the point of weld. This accounted for the symptoms, which disappeared when a stream of uncontaminated air was directed across the breathing zone beneath the welding helmet.

Therapeutic Skills

Therapeutic skills in occupational medicine are now far removed from the simple removal of splinters or the repair of lacerations or crushing injuries. Prior to therapy, multiple diagnostic techniques required include a working familiarity with functional studies of all body systems; an understanding of methods of evaluation of metabolism and hematology, including in many instances bone marrow studies; a practical grasp of characteristic symptoms of workers exposed to toxic substances; and an ability to correlate knowledge of new processes and potential hazards in order to prevent disease and disability. Again beyond the realm of diagnosis for occupational disease, we now have added to our armamentarium of treatment the application of specific drugs such as BAL for mercury intoxication and the chelating agent edathamil calcium-disodium for lead intoxication.[2]

Nonoccupational disease is chiefly a problem for the family doctor. The physician in industry must maintain a close and friendly relationship with him. Frequently, emergency care must be given to members of the aging group in industry, including that for acute episodes of coronary disease. Such patients are then referred promptly to the care of the family physician. Later, however, rehiring such individuals must be considered. From research and practical knowledge pooled from experience all over the world, it is now known that in most instances such men can be rehired with safety for both the worker and the employer.[3] Such rehiring may serve a threefold purpose: (1) saving a man's justifiable pride in making his own living, (2) avoiding the necessity of his turning to public relief for support, and (3) conserving his skills built up over many years. Development of the courage required of the physician in making the decision to rehire such a worker can be one of his greatest rewards.

Prophylactic Skills

It is obvious that prevention is the best treatment of any occupational illness and injury. As far back as 1700, Ramazzini pointed out that it is the physician's responsibility "to suggest medical precautions for the prevention and treatment of such diseases as usually affect the workers."[1] Modern occupational medicine is both a challenge and a satisfaction because one is constantly engaged in the effort to prevent occupational disease and disability. This involves the physician's intimate knowledge of shop processes and industrial exposures. Such understanding can only come from periodic and unannounced study of the working place during plant tours, preferably in company with the safety-man and the industrial engineer. A few minutes spent in clinical observation of a man at his work in the shop may explain his physical disease or disability much more concisely and clearly than the best written report the physician may receive from supervising or safety personnel.

After management's confidence has been earned, the occupational physician is consulted in advance when a new process is to be put into production. He can then advise as to potential hazards rather than later see several cases of acute poisoning develop. He can suggest, for instance, that such relatively safe solvents as methylchloroform be substituted for such dangerous ones as benzene or carbon tetrachloride. If toxic substances must be used, the physician should be familiar with the general principles of engineering safeguards. For example, in planning for protection against lead poisoning he should understand the value of properly designed down-draft suction through slotted inspection tables, as in the case of assembly work in modern battery plants. Here, too, as a double safeguard, respirators may be used as a temporary measure of protection, but only until more adequate ventilation can be built into a production line of machines by the ventilation engineers. Such engineering familiarity of the physician is not acquired alone by an advanced degree in either engineering or industrial hygiene. It does require that every part-time or full-time industrial medical consultant use keen observation and experience gained from frequent plant tours.

Medical control of industrial inhalation hazards is important as an extra check on the efficiency of ventilation procedures. Though the concentration of dust, fume, vapor, or gas in the air to be breathed can be accurately studied by the industrial hygienist, actual evidence of human absorption of such substances can only be evaluated by the physician who studies a particular patient in his reaction to his environment. To be sure, it is ideal if engineers can guarantee that the maximum allowable concentration of a toxic material is never exceeded. Actually, however, machine breakdown and worker failure not infrequently cause unsuspected absorption of dangerous substances. To be able to track down the source of unexplained symptoms of occupational intoxication is a particularly stimulating and rewarding experience for the plant physician.

To obtain early warnings of such failure of ventilation control or worker alertness, the physician in charge of the health of the industrial worker must have in operation a systematic plan for periodic medical examination of the men potentially exposed. For this program specialized physical examination procedures and simple tests of blood and urine are readily available to the average physician, even in the smallest industry and in the smallest community. In this regard, it should be borne in mind that the vast bulk of the worker population is in the small industries, those employing from 5 to 500 workers, which are usually too small to afford a full-time medical staff. Here lurk some of the most serious death-dealing hazards, because they are unsuspected by employer and worker alike.[4] Consequently, informed part-time medical consultation to such small industries is one of the most vital and broadest opportunities of the medical profession.[5]

To be specific, in workers exposed to lead, for example, basic medical control studies should include an examination of gums under a lens, for lead lines; evaluation of extensor strength of the wrists; study of hemoglobin level and stipple cell counts; and qualitative study of the urine for porphyrin. None of these tests is subject to the error of air-contamination, and all can be done at frequent intervals of two to four weeks with no objection from the worker. They are all relatively inexpensive. Both the general physician and the internist can readily master all these procedures.

Most of these convenient and simple tests have been widely and successfully used in the United States, in Canada, and abroad for many years, in both large and small industries, as practical measures to evaluate the safe level of lead absorption. Some years ago, in a brass foundry in which lead exposure was unrecognized, I found evidence—in less than 20 minutes—of a high level of lead absorption by using equipment immediately available to every practitioner of medicine. This "equipment" included a 95-cent hand lens, perfect illumination by direct sunlight just outside of the foundry, and my own eyes. Six of 12 men pouring brass showed lead line of the gums, indicating a potentially dangerous lead absorption, though not necessarily lead intoxication. This quickly acquired information was as valuable to me, in sounding an immediate warning, as an elaborate and time-consuming quantitative analysis of blood and urine for lead levels. At times, to be sure, especially when engineering preventive technique is practically perfect, one can rely to a considerable degree on less frequent periodic quantitative analysis of blood and urine for lead and other materials. The practical, nonspecific qualitative techniques, however, are often rewarding to small industries, whereas the specific quantitative laboratory studies are more often available only to large organizations.

Skills in Human Relations

A further satisfying reward for a physician in occupational medicine can be his sense of a personal contribution in the field of human relations. Through his day-by-day contact with workers, in his office and out in the plant, the men come to learn that the physician in charge is primarily interested in their welfare and safety as he deals with them frankly, without subterfuge or evasion. It has been my experience that they so trust the plant physician that they come promptly to him with their fears about an unsafe process, even before they feel free to discuss them with the union steward or their own foreman. If a physician is honest with himself and others, he can become a key man in a health organization composed of the worker, management, and medical department.

In addition to the confidence of the worker regarding his work conditions, the plant physician's human contacts offer him another intangible recompense. Just as in the case of a family physician, the occupational physician may render invaluable aid as he counsels a worker struggling with personal problems involved in facing life and death at home. The rare art of listening, such as the skilled psychiatrist has learned from training and experience, when mastered by a plant physician can result in valuable furtherance of the employee's confidence. So skillful can the physician in industry become in understanding and fostering the working complex of labor, technician, and management that in a few instances such physicians have been chosen as vice-presidents in charge of all personnel problems.

It is a revealing experience to a highly individualistic person, which every doctor is, to work with a business organization where each activity is the result of many skills focused on a single problem. Indeed, when illness comes to the usually strong and well individual whom a physician has known in his full powers and ability to work in the plant, there is even more than the ordinary challenge in the effort to encourage the return of such a man to his earlier usefulness and responsibility.

Opportunities in Occupational Medicine

Aside from compensations gained from the effective use of scientific principles and of human factors of environmental medicine, the modern physician in industry must look at his economic situation in a realistic manner. As with many other physicians, he must balance the time and money spent in his long years of professional training against the time available in each busy and precious hour which he places at the disposal of industry. The supply of physicians qualified by graduate training for positions as full-time medical directors is at present entirely inadequate. The economic reward for such specially trained physicians' services includes not only an adequate salary in addition to absorption of office overhead but also important fringe benefits involved in inclusion in group employee plans for insurance and retirement, as well as a usual guarantee of continuous employment with regular hours.

For the physician engaged in general practice or in many of the specialties of internal medicine and surgery, there is an unequalled opportunity for part-time consultant work in industry. This may grow to involve at least 50% of the consultant's time if he has given special study to the problems involved. Techniques of the part-time consultant are not only those used for proper placement and periodic examination but also those required for specific toxicological hazards. If the physician has the endurance required for living what is really a double life, both in private practice and in part-time medical consultant work in industry, he may find that his gross financial reward is somewhat greater than that of the full-time medical director. As with the full-time medical director, the part-time industrial medical consultant must not undervalue the worth of his services. In my own experience this end is most fairly served by rendering a fee for the hour for time spent not only in medical examinations but also in plant surveys, as well as on measures devoted to the prevention of occupational disease and disability.

Industry can provide the physician consultant, be he part-time or full-time, not only advantages of economic security but also the assurance in many instances of financial support for a stimulating program of continued medical education and clinical research. Animal experiments are of great importance in modern medicine. We know that clinical observations are fully as important. In industry, the physician has the opportunity to compare on a clinical basis groups of men accidentally exposed to toxic substances with control groups of unexposed workers. From my own experience, no clinical test is too complicated or too expensive for enlightened industry to undertake when necessary. Under the guidance of an experienced clinician such controlled studies have proved of inestimable worth. They enable the physician to evaluate the effectiveness of various medical measures which may be used either in immediate treatment or in prevention of disease and physical disability associated with the occupational environment.

Industry has also come to realize that the medical department can make or break the efforts of the entire personnel organization. Labor, meaning people, is the largest cost item in industry. Workers often get their first impression of a company in the way they are handled at the time of a preemployment examination. Frequently, afterward, when they come in for emergency medical care, periodic reexamination, or counseling with intimate personal problems, this presents a key opportunity to further friendly relations between worker and management. Industries are accustomed to put a fair price on consultation in the field of engineering or invention. They are now learning to pay physicians in proportion to their skill and responsibility both as medical consultants and as potential experts in human relations.

Conclusions

To the industrial physician no greater challenge and resultant reward exists than that which can be achieved by preventive techniques and medical diagnoses. The meeting of such a challenge depends on both foresight and insight. This the medical profession can and must contribute to modern industrial society. The study and treatment of occupational disease has become more exactingly complex, but after 250 years perhaps our greatest satisfaction lies in confirming the worth of the original philosophy of Ramazzini, as he stated in 1700, "I have tried to unearth in the shops of craftsmen, for these shops are schools whence one can depart with more precise knowledge, whatever may appeal to the taste of investigators, and, which is the main thing, to suggest medical precautions for the prevention and treatment of such diseases as usually affect the workers."[1]

561 N. 15th St. (3).

References

1. Ramazzini, B.: Diseases of Workers, translated by W. C. Wright, Chicago, University of Chicago Press, 1940.

2. Belknap, E. L., and Perry, M. C.: Treatment of Inorganic Lead Poisoning with Edathamil Calcium-Disodium, A. M. A. Arch. Indust. Hyg. **10**:530-547 (Dec.) 1954.

3. Rosenbaum, F. F., and Belknap, E. L.: Work and the Heart, New York, Paul B. Hoeber, Inc., to be published.

4. Belknap, E. L.: Unsuspected Industrial Poisonings Discovered in Small Industries, Henry Ford Hosp. M. Bull. **5**:227-238 (Dec.) 1957.

5. Eckardt, R. E.: Clinical Toxicology and Practicing Physician, J. A. M. A. **166**:1949-1953 (April 19) 1958.

THE PHYSICIAN AS ADVISOR TO INDUSTRIAL MANAGEMENT

Clifford H. Keene, M.D., Oakland, Calif.

The physicians dealing with problems of occupational medicine and industrial injuries stand in various relations to industry. Some are in community practice, and among their patients are employees sent by management for treatment or for answers to specific questions. Others have become specialists in occupational medicine through experience and by academic training, and they are employed by industry, although they must function on an impartial basis. Finally, some physicians function as medical directors, as integral parts of management with responsibility for policy and for decision. The goal of organized labor is complete prepaid medical care for the worker, his dependents, and the retired person. As this setting changes, the physician will have to accept greater responsibilities, and the degree to which he is able to do this will affect the future practice of medicine.

If you are earning your daily bread by the practice of medicine in 1958, much of the money in your pocket got there from sources argued about and agreed on by a working man and his boss.

Beginning in 1910, the pangs of national conscience in the United States brought about the first of the state workmen's compensation acts providing income and medical care to an individual injured at work. The New Deal in 1935 fathered the Federal Insurance Contribution Act providing retirement income to working persons over 65 years of age or income to their surviving families. World War II froze wages and increased taxes and thereby prepared the way for "fringe benefits." The Internal Revenue Service then ruled that the cost of health and welfare programs which made up fringe benefits could be deducted as a business expense by an employer but were not considered income to an employee. In 1948 the National Labor Relations

---

Director of Medical Relations, Kaiser Industries Corporation.

Read in the Symposium on Occupational Medicine for the Private Practitioner before the Joint Meeting of the Section on Preventive Medicine and the American Academy of Occupational Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

Board ruled that health and welfare plans and pensions were proper matters to be negotiated between unions and industrial management.

In the 1920's, I was an apprentice ironworker, Local No. 6, in Buffalo. My wage was $1 an hour. I worked 44 hours per week. Each week I received $44 in cash. There were no deductions, and I spent all of it without help. Not so today! For example, it has been calculated that a California worker with three dependents who earns $90 a week has a payroll cost to his employer of $115 per week, while the employee has a take-home pay of $70.36. This average employee and his boss contribute a total of $45.64 per week to comply with legal and negotiated programs. Contributions must be made for federal old age and survivors' insurance, state workmen's compensation, the California unemployment insurance program, and the California unemployment compensation disability program—all of which are required by law. As a result of union-management negotiation, this average industrial employee receives the benefits of a health and welfare package which probably includes life insurance, supplemental disability insurance, accidental death and dismemberment insurance, a pension plan, and some form of prepaid medical care. The medical profession is involved in almost every one of these social changes. As an astounding result, industry as a whole now pays as a cost of operation much of the bill for the medical welfare of the work force as a whole.

Role of the Physician in Industry

The economics of the practice of medicine have been completely altered by the social forces generated out of industry in the past 50 years.

Industrial Physicians.—No class of physicians is more involved in the complexity of these changes than the industrial physician. Indeed, it can be observed that a physician's broad value to an industry is proportional to the help which he gives in complying with the obligations of these social changes. It is my observation that few industrial physicians are fully aware of this aspect of their position. Follow me in a brief appraisal of the roles which the physician can play in the economics of industry.

The simplest relationship of a physician to industry occurs when he provides treatment in his office or in a local hospital to injured employees of a nearby plant. The employees are cared for and returned to work, and the relationship is terminated by the payment of the bill. This is an essential service required by the Workmen's Compensation Act, important to the individual, a small expense to the employer, and a source of some income to the doctor.

The next step involves the performance of physical examinations on employees or prospective employees. In the request by industry to examine and evaluate an employee, the doctor is being asked a simple question which may be "Is this man hurt?" "Can this employee work?" or "Should this person retire?" Here the physician assumes a significant responsibility, because he must express an opinion. This opinion may well be considered from the diverse viewpoints of labor and management. The several viewpoints may produce dissatisfaction leading to a remedy which heretofore has always increased cost.

The physician who performs a preemployment evaluation is being asked by management to answer three questions: "Is this individual capable of doing the job which we have offered him without harm to himself or danger to others?" "Is he an ordinary risk under the Workmen's Compensation laws?" "Can we expect to recover the investment which we make by hiring him?"

The industry, to say nothing of the individual, suffers by an injudicious medical opinion based on incomplete information or lack of familiarity with the circumstances of the job in question. If for any reason an applicant is declared not suitable for hire, it costs somebody some money. By virtue of the circumstances, the examining physician is at that moment the most able member of society to prevent another unproductive dependency on the resources of the group and ultimate cost to industry. Certainly the physician does not exceed his prerogative by informing the employer exactly where an individual could be used or by advising the individual just how to correct the inadequacy which disqualifies him for a job. The cumulative results of such actions on the part of all physicians who serve industry must be apparent.

The physician in community practice who cares for industrial injury and who performs preemployment examinations may carry out these functions in a competent professional manner yet be of incomplete value to the industry with which he is related. The fault here lies in communication. As I mentioned before, whenever industrial management sends an employee to a physician it is for treatment or for an answer to a question. In good conscience but with indifferent result, the physician can reply to management by saying something as follows: "Give this man a light job." "This person may work if there is no strain." "This individual can work if there is nothing to bother his hay fever." In advice such as this, he leaves the actual decision to someone else who will say what is light work for this man, what is bothersome to the hay fever of this man, or what is a strain for this man. These basic questions of medical nature will be settled by a safety man, a foreman, or a union steward. The physician may have answered in a vague way because he is vague about the industrial environment of his patient and is fearful of a positive statement. A visit to the plant by a physician is always welcomed and is a source of satisfaction to all. As a matter of practice in the Kaiser Industries, the performance on the premises of a plant of as much of the medical services as is feasible is required in order to promote the awareness of the problems of the plant on the part of medical department personnel.

Specialist in Occupational Medicine.—In the next higher category of physicians in industry is the employed specialist in occupational medicine. Through experience, and in the past decade by academic training, a class of physicians with special knowledge of industry has been created. This specialist possesses a trained viewpoint whereby he sees the worker as an inhabitant of an abnormal environment where through guidance of the man and control of his surroundings compatibility between a man and his job is obtained. This is the world of the plant physician who plays his role before "labor and management," the most critical audience now viewing the medical scene. This specialists' opinion is sought on every aspect and detail of the laws and union-management agreements which involve health or disability. It is true that the physician is employed by management, but he must function on an impartial basis. He achieves maximum consideration by diplomatic expression of his opinions, awareness of the prerogatives of management, and respect for employees as the patients which they are.

In addition to guarding the health of employees, it is in this daily contact with the interplay among interests that the industrial physician has opportunity to influence the future costs to his industry and the economics of his profession. For example, one of the characteristics of strong unionism is the practice of an employee to take his troubles to his union steward. This is especially true when he is dissatisfied with the workings of whatever general medical care plan happens to be in effect. In the mind of the employee, the program was acquired by union negotiation and its defects can be remedied in the same way. The plant physician can play an effective role if the steward feels he can appeal to him for aid. Many causes for grievance in the workings of the medical program can be disspelled by an explanation or settled by a telephone call from the plant physician to a fellow physician in private practice. The diplomatic plant physician can do much to insure that our present prepaid programs of medical care function with effectiveness. Let the physician keep in mind that the goal of organized labor is complete prepaid medical care for the worker, his dependents, and the retired person. If this cannot be provided within the framework of the present system, it is likely to be secured under governmental auspices. Both prospects involve increased cost to industry. The second is an unwelcome prospect to the profession.

Medical Director.—With the increasing burden on industry of the cost of nonsalary employment benefits, the importance of the physician in the councils of management has grown rapidly. Actually, there is no last and top step to which a physician can climb in the large American industries. Near the top, however, the medical director functions as an integral part of management with responsibility for policy and for decision. He speaks with and for management in the broad areas of health and medical welfare. In addition, he is a student of economic trends in medical care and is alert to the size of the dollar sign associated with all medical projects. He is a businessman who happens to have a degree in medicine.

Conclusions

The vortex of the vast changes in the practice of medicine during the past 50 years has been in industry. These changes have compounded rapidly the value of the physician in the councils of industrial management. The physician is offered great opportunity in modern industry but must accept greater responsibility. The effectiveness of the industrial physician bears considerable relationship to the future practice of medicine. In fact, what you do in industry will shape the medical practice of your sons and grandsons.

1924 Broadway (12).

REVERENCE FOR HUMAN LIFE.—He who attends the birth of the human race and sits at the bedside of a dying world, and throughout his career, serves, at times, as the temporary custodian of life, cannot be devoid of a great reverence for a higher power than his own. Religion is the fiber of which we weave our moral code, and medical ethics is essentially a moral code which physicians have set up for themselves, a code which has guided the profession since the times of Hippocrates, when he wrote: "A physician should be an upright man, instructed in the art of healing . . . modest, sober, patient, prompt to do his whole duty without anxiety; pious, without going so far as superstition, conducting himself with propriety in his profession, and in all the actions of his life." Twenty-two centuries have passed since those words were written. This suggests a thread that runs through the practice of medicine: that neither time, nor science nor men, can change—the physician's great reverence for human life marks him as a religious man. —J. R. Hudson, M.D., The Doctor Dons Many Hats, *Cincinnati Journal of Medicine*, October, 1958.

HOSPITAL EMPLOYEES–CORRIDOR CONSULTATIONS OR HEALTH MAINTENANCE?

Jean S. Felton, M.D., Oklahoma City

The creation of an employee health program in a hospital is a logical step in the provision of a fringe benefit to underpaid and frequently aged and disabled workers. The needs for medical surveillance in the hospital situation are multifold and relate to the built-in hazards of the operation of patient care. These hazards include infectious disease (tuberculosis, Q fever, homologous serum jaundice, staphylococcic infections, and other bacterial, viral, rickettsial, parasitic, and fungus disorders), contact dermatoses, ionizing radiation, and patient-induced trauma and other injuries. Estimation of the work capacity of applicants for work, medical preparation of accepted applicant for work, maintenance and improvement of health status of employees, medical supervision of the work environment, and medical care for illness and injury, compromise an ideal health service.

Closest to the sources of medical attention, yet farthest from scrupulously detailed, documented, and executed diagnosis and treatment are most of the hospital employees in the United States. Comprising 1,375,000 persons, and an industry of over 6 billion dollars in total expense, this occupation ranks high among America's manufacturing, commercial, sales, and service enterprises. In 1950, employment numbers in "medical and other services, including hospitals," ranked seventh to the following industries: agriculture, construction, wholesale trade, food and dairy products stores and milk retailing, eating and drinking places, and private households. In 1956, the total gross value of hospital assets was about 13 billion dollars and the combined payroll was nearly 4 billion dollars.

These figures are offered to give a sense of gross dimension to the population segment under consideration and its work sites. Were these data to be compiled from true industrial organizations engaged in creating the world's marketable goods, one would find extensive programs dedicated to preventive medicine and the health maintenance of the employee. Of the 500 largest industrial corporations in the United States,[1] ranked according to sales, nearly all have medical departments, most of them functioning on a full-time basis. In a survey conducted recently of 62 university medical centers,[2] only 50% conducted preplacement physical examinations on applicants for employment and even less offered immunization programs.

Hospitals and Health Services

Why has the establishment of health services to employees lagged so far behind in these institutions? Why are hospital personnel given secondary position to student groups in both the teaching center and the hospital providing a diploma program for student nurses? Most hospitals stem traditionally from charitable beginnings, and, because of these dedicated and humble headwaters, a certain sacrifice was expected and few personnel "extras" became available.

The hospital worker, particularly in a university center, comes usually from a lower socioeconomic group and is fitted into a low wage scale. Many in this group are aged or are physically marginal, if not definitely handicapped, persons. Little is offered in the form of fringe benefits in lieu of adequate monetary compensation. The hospital industry is not the most modern, and only recently have some of the institutions installed machine record systems, electronic cost accounting methods, or other time-saving and labor-saving devices common to industry. Fringe benefits seem to have escaped the awareness of administrators; in 1957, these benefits (nonwage payments) in all industries came to 49.5 cents per employee per hour.[3] Yet, these employees can be as much of a health hazard to the patients, students, and each other as any miscellaneous, unexamined group of visitors to a hospital. In only 21 of the 62 medical centers surveyed were the workers given chest examinations roentgenographically. Many of the persons currently in medical job categories are those with high disease attack rates, and many were formerly employed as domestics, whose "private physicians" are usually the outpatient departments of university or private hospitals. Further, it is not uncommon for semiskilled paramedical personnel and even professional nurses to hold two jobs, frequently working 16 hours in a single day. This results in some of the undesirable sequelae of "moonlighting," and both health and efficiency in job performance can become impaired.

Professor of Preventive Medicine and Public Health (Occupational Medicine), University of Oklahoma School of Medicine. Dr. Felton is now Professor of Occupational Health, School of Public Health, University of California at Los Angeles.

Read in the Symposium on Occupational Medicine for the Private Practitioner before the Joint Meeting of the Section on Preventive Medicine and the American Academy of Occupational Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

Recent Action and Existing Programs

A. M. A.-A. H. A. Action.—For two years, a joint committee of the American Medical Association and the American Hospital Association has met to outline some principles for the establishment of health services in hospitals. Produced finally, with the approval of the Board of Trustees of the A. H. A. and the House of Delegates of the A. M. A. (May 19, 1957), was the document, "Guiding Principles for an Occupational Health Program in a Hospital Employee Group."

In its foreword it is stated, "Employees in hospitals are entitled to the same benefits in health maintenance and protection as are industrial employees. Therefore, programs of health services in hospitals should use the techniques of preventive medicine which have been found by experience in industry to approach constructively the health requirements of employees." The purposes and scope of such a service are outlined, and the required personnel and facilities are discussed.

It has been questioned why one decants off this special group for occupational health consideration without doing the same for other categories of workers in other industries. A member of the Council on Industrial Health expressed it succinctly when he said, "In some hospitals, employees are like the cobbler's children who have no shoes—they have inadequate health protection in an institution of healing." In an establishment where there can be 225 different job classifications, from custodian to superintendent, there are the same needs for preventive health maintenance of the personnel as in any plant, warehouse, research laboratory, department store, or utility company, and perhaps more because of certain hazards peculiar to its operation.

The A. M. A.-A. H. A. publication describes in general the kind of program envisioned for hospital installations, and it will not be necessary to repeat its premises or primary points. However, it is felt that one can emphasize the objectives of such a program, and these can be stated as follows: to increase the health of the hospital worker, to increase efficiency, to minimize illness-absenteeism, to improve employer-employee relationships, to identify job-related personnel problems for resolution, to increase the morale of hospital personnel, to improve methods of placement, to lower employee turnover, to promote safety, to lower the cost ratio of insurance, and, whenever possible, to initiate and carry on research germane to the clinical situation.

Is the Concept New?—What makes one hospital more progressive, more far-seeing, and more concerned about its staff than another? This question is not answered by a single social diagnosis. Some administrators have been unexposed to industry's methods of recruiting and retaining personnel with all the adjuvant devices required to build a sense of purpose and a feeling of personal responsibility into the job, such as service pins, incentive award systems, increasing vacations with length of service, channels for grievances, and the symbols of office, be they shoulder patches, uniforms of distinctive color, or name plates on desks.

Perhaps the absence of a tangible visible product gives the employee less with which to identify his labors, and it is difficult to understand or look on "patient care" as the end result of his efforts. The absence of a profit, the lack of a sales record, the missing force of commercial competitiveness—all may create in the minds of the managerial group the belief that a hospital is "different" and requires little of the compensating human relations elements of a profit-making enterprise. But any organization whose function is based primarily on human interaction will have greater need for modern personnel methods than a company engaged solely in distributive activities or raw material procurement. The stereotypes of the hospital staff—the money-demanding business office cashier, the threatening unwelcoming receptionist, the "how are we this morning?" nurse, and the visionless dust-leaving maid—are still in sufficient number in healing centers as to alienate many current and potential patients. Were there no need for considering hospital staffs different from industrial groups, why would such books as "Give and Take in Hospitals," "Diagnosing Human Relations in Organizations—a Case Study of a Hospital," "Human Problems of a State Mental Hospital," "Role Relations in the Mental Health Professions," or "Change and Dilemma in the Nursing Profession," be undertaken, or why would such articles be indicated as "Humanizing Hospitals," "Human Relations in Hospitals," "Keeping Employees Satisfied," "What Nurses Like and Dislike About Their Jobs," or "Workers' Morale Related to Supervisors' Orientation in Human Relations"? That this awareness has been increasing points up the necessity for patterning some of the hospital's methods of operation after the more successful institutions in commerce and industry.

Existing Programs.—Some hospitals have recognized their responsibilities in the area of employee health and have provided facilities for this. Beth Israel Hospital in Boston, St. Vincent's Hospital in New York, Mount Sinai Hospital in Cleveland, Beth Israel Hospital in New York, New Haven Hospital in Connecticut, Wesley Memorial Hospital in Chicago, and the New England Medical Center in Boston are among those which have provided a service under such designations as Personnel Health Service, Personnel Health Clinic, Health Service Department, Employee and Student Health Office, Employee Health Service, or Health Service.

The research committee of the Hospital Personnel Association submitted questionnaires on this subject to 60 members of its organization and received 36 replies, representing 28 New York area hospitals and 8 in New Jersey. Of this group, 34 had employee health programs, most of these offering physical examinations, laboratory tests, emergency care, and health insurance. In 1955, a group of hospitals in Massachusetts was surveyed, and in a 66% return (99 responding out of 150), health services were found to be maintained in 56.

Some institutions have completely divided services, so that one program is offered to students (medical and graduate), another to student nurses, and a third to employees. Frequently, when a hospital is part of a municipal government the employees' health service is a segment of the program provided for city employees. Specialty hospitals require different types of preventive care, so that at the National Institutes of Health, where there is an unusual concentration of potentially hazardous work exposures, the Employee Health Service is tailored to meet the needs of 5,000 investigators and their staffs working in the seven institutes, the hospital, and the four special divisions comprising this large medical research center.

At the Institute of Living, Hartford, Conn., a large psychiatric hospital of 988 employees, 185 of whom reside on the grounds, a personnel physician and a full-time personnel nurse exercise employee health functions. An internist has a comparable assignment at the C. F. Menninger Memorial Hospital, Topeka, Kan. In the Veterans Administration hospitals, centers, and regional offices, employees' health and emergency treatment programs are authorized to foster health improvement measures, and there is assigned a qualified physician to act as personnel physician.

Indications for Health Programs—Occupational Hazards

The needs for medical surveillance in the hospital situation are multifold and relate to the peculiarly built-in hazards of patient care. Specific areas of occupational health risk exist, different from other worksites, with the possible exceptions of laboratory and field research, pharmaceutical manufacturing, and nonmedical radiography. To be considered here are infectious diseases, dermatoses, radiation hazards, and patient contacts and trauma.

Infectious Diseases.—The risk of tuberculosis to medical and nursing personnel has been recognized since 1889, when the high death rate in the Catholic nursing orders in Germany was commented upon by Cornet. In a study of the period 1864 to 1889, he observed that a 17-year-old girl entering hospital nursing died 21½ years earlier than a comparably aged girl in the general population. Tuberculosis was estimated to account for 63% of the deaths among the nursing nuns.

Many groups have been examined and followed up since these early epidemiologic efforts, and longitudinal studies involving large numbers of persons have been in progress for many years. In a study conducted at the University of Minnesota, of 5,304 student nurses who graduated from 1930 to 1951, 15.2% had been infected before admission. Of the remaining 4,497, infections were acquired by 1,020 (22.7%). In the classes from 1930-1942, of the 1,619 who were uninfected on entry 575 (35.5%) developed positive reactions on tuberculin testing. In the 1943-1949 classes, there were 1,876 uninfected on entry, and of these 324 (17.3%) converted. Of 1,002 nonreactors after 1949, 121 (12.1%) converted. All of these had multiple primary lesions; about 3.5% developed clinical tuberculosis; and there were seven deaths.

Experience with U. S. Navy nurses was reviewed for the period 1941-1950,[4] and in this time 100 were admitted for treatment of active tuberculosis. Although the disease was officially accepted as duty-related, the authors were not convinced that infection had occurred during naval service.

An extensive literature survey by Eleanor C. Connolly of the National Tuberculosis Association led to these conclusions in 1950:

> 1. The statement that extremely high infection rates prevail among medical students and particularly among nurses cannot be refuted on the basis of present studies. 2. It is difficult to attribute higher tuberculosis morbidity rates to hospital personnel than to the general population of comparable age because of the diversity of methods employed in determining morbidity. Many authorities writing on the subject, however, believe that tuberculosis represents an occupational hazard for the hospital worker. Tuberculosis case fatality rates among hospital personnel are extremely low. 3. Some studies indicate that persons originally nonreactors develop tuberculosis more frequently than reactors. Other studies show no correlation between ultimate development of tuberculosis and the original tuberculin reaction. Most studies indicate excessive morbidity in a relatively brief period of time after development of a reaction to tuberculin. 4. Responsibility for further control of tuberculosis in the hospital cannot be postponed until future studies of greater scope are made. Such postponement would represent an academic evasion of the problem since certain defects of the environment in many hospitals are already known to exist. The routine x-raying of patients admitted to general hospitals, the maintenance of aseptic techniques, and a rigid policy of routine observation of personnel in an effort to detect early evidence of lesions seem to be three minimum requirements of any control program. 5. Finally, even though morbidity and mortality in hospital groups may be low, tuberculosis must be considered in terms of a chronic disease. Because of the time consumed in treatment, the implications of such a disease are never simple even for the person whose case is uneventful and concludes with recovery. Certainly, the hospital, of all institutions, should utilize every practical means to avoid even one case of tuberculosis.

Brahdy has lamented the lack of control of exposure to tuberculosis in hospitals and has accredited this failure to "insufficient examinations and to faulty case-finding technique." For correction, he advocates an examination program of all hospital employees, dual reading of films, and the designation of one physician as hospital epidemiologist. Those employed in laboratory and hospital mortuary work were observed to experience an attack rate from tuberculosis severe enough to lead to an illness-absence from work three times higher than that for laboratory personnel not exposed.[5]

Tuberculosis as an occupational disease has become the cause of claims before workmen's compensation boards and commissions. As an example of such action, the Superior Court of Pennsylvania, on appeal of a nurse who had developed tuberculosis, pointed out that "the incidence of acquiring tuberculosis among general hospital personnel is higher than that of the general population because such personnel come in contact with unrecognized pulmonary tuberculosis and fail to take the precautionary measures that hospital personnel in tuberculosis sanatoriums take as a matter of routine." The court held that the Occupational Disease Act of that state should be construed liberally in favor of the employee, and the award of the lower court was affirmed.[6] From 1942 through 1955, 90 employees of the Los Angeles County Hospital received compensation for tuberculosis. (The incidence among those exposed, such as physicians, nurses, and laboratory technicians, was six times that of clerical and other nonexposed personnel.) This is costly to hospitals, for it can involve any or all of the payments for work time lost, medical care, death benefits, and funeral costs.

Other infectious diseases appear among hospital employees as occupationally incurred, and these have included Q fever among 47 laboratory workers at the National Institutes of Health. Sulkin and Pike collected data regarding the occurrence of laboratory-acquired infections in the United States, and reported on 1,342 such infections, which involved research institutes, public health laboratories, hospital laboratories, manufacturers of biologicals, agricultural and veterinary schools and experimental stations, colleges and medical schools, and clinical laboratories. The attack rate was 0.5 per year per 1,000 in a population of almost 121,000 estimated to be at risk annually. The types of personnel acquiring disease included trained scientific personnel, animal caretakers, janitors and dishwashers, students (not engaged in research), and others, including clerks, maintenance workers, and visitors. The types of infection were bacterial, viral, rickettsial, parasitic, and fungus.

Since 1943, considerable attention has been given certain aspects of infectious hepatitis and homologous serum jaundice, particularly when these are acquired through accidental transfer via parenteral infusions and immunizations. Hospital employees whose work exposes them to infected blood are subject to these occupational diseases, and 16 hospital workers [7]—blood bank personnel, physicians, nurses, laboratory technicians, and a dentist—were reported as developing homologous serum jaundice while engaged in duties which exposed them regularly to the possibility of accidental parenteral inoculation of blood or its derivatives.

Of tremendous contemporary significance is the incidence of staphylococcic infections in hospitals, with strains resistant to antibiotic therapy. Whereas institutional epidemics in the past have not involved the personnel, these virulent organism strains particularly have produced boils, but without the demarcation usually characteristic of these lesions.[8] These epidemics have become sufficiently widespread as to have led to a Conference on Staphylococcus Infections in the Hospital and Community sponsored by the American Medical Association, held in Cleveland, Nov. 14, 1957, and have been described in hospitals in Pennsylvania, Texas, Ohio, California, New York, and Massachusetts. A high percentage of carriers has been found among hospital workers, and a newly intensified awareness of the importance of environmental cleanliness has been created. In various hospitals, members of the staff demonstrated an incidence of carriage of the predominating strains in mass infections from 6.7 to 17.7%.[9] Langmuir, with some conviction, has stated that the sources of these infections were to be found among the patients and the attendants, including the physicians. He adds, "More subtle and perhaps equally dangerous is the infected but healthy carrier among the attendants."

Dermatoses.—Skin reactions to medicaments and other contactants in the course of professional work have been known for years. With each new material introduced, nurses and physicians—but particularly the former, as they are more frequently engaged in the preparation of the material for the patient—will develop a morbid dermal response to the agent. There have been sensitivities reported to local anesthetics and to antibiotics (including penicillin, streptomycin, and dihydrostreptomycin). To cite one study made in England,[10] 70 local health authorities and 76 chest hospitals and sanatoriums were queried as to the presence of sensitivity reactions of nursing personnel to antibiotics. Reported were 256 workers—a total of 1,470 was at risk—including members of the medical staff, the hospital nursing staff, district nurses, and hospital dispensers, who had developed reactions to streptomycin, penicillin, chloramphenicol, and *p*-aminosalicylic acid. An example of a relatively new agent to be added to the list of dermatogenic medications is chlorpromazine, a strong cutaneous sensitizer, and several case reports have appeared describing the contact dermatitis resulting among nurses, dentists, and pharmacists.

Other agents have led to contact dermatitis in professional persons, such as isoniazid and benzidine. Radiodermatitis is common in physicians, but less of this is being encountered in the more recently trained radiologists and dermatologists.

Radiation.—The introduction of radioisotopes into hospital use has added to the radiation sources of radium, radon appliances, and x-ray equipment to which hospital workers are exposed. Health physics was developed during World War II as a separate discipline to guide workers in radiologic protection. More particularly should these protective measures be extended to hospital personnel other than radiologists, physicists, radioisotope laboratory technicians, and others who are potentially exposed to ionizing radiation. This includes operating room personnel, nurses, nurses' aides who hold or position infants for diagnostic radiography, and dental technicians. Measurements made of exposures received by surgeons and hospital personnel assisting in cystourethrography, cerebral angiography, angiocardiography, femoral arteriography, aortography, cardiac catheterization, bronchography, and similar studies "demonstrated that safety habits were poorly developed in a majority of non-radiological personnel."[11]

The preparation and use of radium and the use of fluoroscopy afford a much greater risk of overexposure to radiologists than diagnostic roentgenography. One radiologist was receiving between 0.2 and 0.5 r per day, and calculations showed that, based on his daily work load, he had received 250 to 500 mr total-body irradiation each day over a period of 20 years. A "routine" blood cell count revealed leukemic cells in his peripheral blood. Barrett,[12] who observed this radiologist, estimated that, in the average case of carcinoma of the cervix with insertion of radium, the following radiation is received: total body, 35 mr; right hand, 150 mr; right arm, 80 mr; fingers of right hand, 200 mr; fingers of left hand, 150 mr; and left arm, 75 mr.

In working with patients who have been administered radioisotopes, Brucer[13] has cited the following exposure values: "The amount of radiation exposure to an attendant remaining close to the bed-side of high dosage patients is considerable. At approximately 1 meter from the patient during the entire course of intra-cavitary gold therapy, over 10 r of 400 kv. radiation was calculated. Hence, a nurse sitting next to the patient could be expected to absorb 1 r of total body exposure in three days. The nurse of a patient treated with 100 mc. of iodine would receive about 1 r of exposure in five days, and with 50 mc. of gallium, the nurse could be exposed to 1 r in about two days."

Exposures, other than therapeutic, exist when pathologists examine the bodies of patients who have received radioisotopes, and specific precautionary measures have been prescribed for those performing autopsies on such bodies, where there may be 5 mc. to over 30 mc. of activity.[14] Personnel monitoring of a dermatology staff in a university hospital has been described,[15] and, in one member, overexposure had been recorded.

With the public apprehension over radioactive fall-out intensifying the concern about exposure to the usual radiation sources—and this "public" includes medical students and hospital workers to a surprising degree—every precaution needs to be taken to insure the minimal exposure required for screening, diagnostic radiography, or therapy, to both personnel and patients.

Patient Contacts and Trauma.—In psychiatric hospitals there is an inherent risk in the daily nursing care situation involving disturbed patients. In a 1,200-bed mental hospital which I had visited as a consultant, the record of injuries sustained by staff members gave evidence of considerable trauma to the personnel. There were 46 injuries in one month recorded involving no loss of time, and, of these, 27 (58%) related immediately to the kind of patient receiving care. In the terminology of the records, these were the notations: struck by disturbed patient, 6; restraining combative patient, 3; packing upset patient, 2; separating fighting patients, 2; struck by patient, 2; struck by resistive patient, 2; attempting to quiet patient, 1; disturbed patient threw wastebasket, 1; dressing disturbed patient, 1; fell when struck by patient, 1; fell while attempting to overtake patient, 1; putting cuffs on patient being held on floor, 1; restraining disturbed patient, 1; restraining patient, 1; taking combative patient to hydrotherapy, 1; and undressing resistive patient, 1—a total of 27.

These were events in an extremely well-run teaching psychiatric hospital—not an establishment redolent of the crudities of bedlam. The statistics released by the United States Department of Labor pointed up the finding that in mental hospitals the injury frequency rate (average number of disabling injuries per million hours worked) is the highest of all hospitals (15.3)—tuberculosis hospitals 11.7, special hospitals 11.3, general hospitals 6.5, and average for all reporting hospitals 8.6. Dr. Winfield Overholser, Superintendent of St. Elizabeth's Hospital in Washington, D. C., has commented on the situation in mental institutions: "The safety and welfare of its patients and employees are of primary concern to St. Elizabeth's and other mental hospitals . . . a meeting was held at the hospital to consider safety measures in the handling of disturbed patients, a small but troublesome fraction of any mental hospital's population. We hope that additional meetings will provide an impetus for further study and consideration of the problems involved, with more effective means to their solution."

The injury frequency rate increases with the size of the hospital but peaks at 13.5 for hospitals with 1,000 to 2,499 employees; in mental hospitals, too, the highest frequency rate of 21.0 is encountered in institutions with 1,000 or more employees.

By operating division, the highest injury frequency is encountered in the plant operation and maintenance division (12.7) and the highest specific area within the professional care division for all hospitals is the nursing service departments (9.1). A distribution by occupation shows these frequencies (per million hours worked): attendants, 19.1; practical nurses, 8.1; nurses' aides, 7.5; orderlies, 7.5; registered nurses, 6.9; and student nurses, 2.3.

The average for this group was 9.1. The greatest number of injuries sustained by nature of injury was in the category "strains and sprains" (33.4), but outstanding was "occupational diseases," which accounted for an injury severity rate (average number of days lost per disabling injury) of 441. Into this group would come occupationally incurred infectious diseases, for example. The hand or finger involved the greatest percentage of all disabling injuries by body part injured (22.0%).

Other hazards productive of injuries to hospital personnel are these: slippery floors, spilled liquids, explosive mixtures from oxygen and the gas or vapor of anesthetic agents, improperly marked exits or entrances, inadequate venting of cooking equipment, volatile solvents in laboratories and electrical repair shops, insertion of glass pipets into corks, sterilizers and autoclaves, lifting of patients, glass ampuls, storage of chemicals, and the use of organic and inorganic insecticides.

The fact that most hospitals are nonprofit organizations has not precluded the administrative problems of workmen's compensation insurance, for hospital employees will file claims with the same alacrity as any other group. For example, a stenographer in a Florida hospital worked in a room where there were two exposed metal pipes and an electric outlet in the floor. Rainfall from a thunderstorm came through the ceiling and settled on the floor. Even though her feet were wet, she continued working, and then lightning struck. She became "paralyzed" and could not remove her hands from the typewriter. There was two months of hospitalization, and the claim was allowed, the court ruling that even if there were no bodily injury the employee did suffer severe shock and mental strain.[16]

In another instance, a nurse, after two months' work in a poliomyelitis ward, acquired the disease. The hospital claimed there was no accident, but the court held that this contention had no validity and that there was a causal connection between the conditions under which the work was required to be performed and the resulting injury claim allowed.[17]

The Physically Disabled Employee

Hospitals have utilized physically limited personnel and have been encouraged to do so by both hospital administrators and those interested in rehabilitation. A study conducted to demonstrate current hospital employment practices regarding disabled persons showed that 86 respondents out of 102 claimed that if the hospital had a lack of applicants for employment then they would willingly hire disabled persons for certain jobs. Responses from 35 nongovernment general hospitals without religious affiliations showed an average of 9.62 disabled employees per hospital, and in 29 which were controlled by religious groups the average was 7.59.

Of 1,003 disabled employees in the institutions studied, 188 were in clinical services, 163 in the housekeeping departments, 111 in the business offices, 107 in the dietary departments, and 96 in maintenance. By type of disability, among 1,047 employees, tuberculosis was first with 41.83%, orthopedic conditions (excluding amputations) 15.09%, cardiac conditions 9.93%, impaired hearing 6.77%, visual impairments 6.30%, mental disorders 6.21%, amputations 3.82%, neurological conditions 2.96%, epilepsy 1.53%, and others 5.44%. The tuberculosis hospitals had an average of 35 disabled employees per hospital, and 86% of these were former tuberculosis patients.

Dr. Howard Rusk has sought the employment of disabled individuals by hospitals and has cited examples of persons with congenital anomalies, gastric resections, laryngectomies, heart disease, diabetes, and stable tuberculosis, as successfully placed in positions, in addition to blind workers. This group is helping to resolve the critical shortage of hospital personnel. A survey of several Catholic hospitals demonstrated that persons with such conditions as amputations, blindness, arthritis, deafmutism, convulsive disorders, hypertension, mental retardation, rheumatic fever, and lower extremity paralyses had been employed and were working capably with "no job adjustment needed."

The reason for throwing light on this employment segment is to point up the facts that these physically marginal persons are filling the job demands, that their activities do not impair their health status, and that physiological, pathological, or senescent changes are appraised and are the functions of an employees' health service. To maintain such a staff in optimal health is not an activity which can be delegated to hospital corridor practitioners; a service must be established for accurate preplacement physical inventories and job adjustment reviews at reasonable intervals thereafter.

Hospitalization Usage

The experience had by hospitalization insurance underwriters in the use of inpatient care facilities by hospital employees is difficult to document. However, the history of one large hospital group which carried this type of coverage for its members and their families is positively known. Because of excessive use, the benefits were lessened, the equivalent of up-rating the premium. Whereas the average number of days per hospital stay, for the period of comparison, for all members of the assured group was 6.4, the hospital employees comprising the subsegment utilized half again as many days per stay, whether they elected to enter their own hospital (i. e., where they worked) or went to other institutions in the community.

No explanation is offered for this except that in the case of teaching hospitals the stay usually is increased. This is mentioned, however, because some control over excessive illness-absence can be exercised by an energetic health service. As all withdrawals from the work scene are costly, the health program, through a good rapport with the employees' physicians, can offer a careful follow-up on return to work. This will permit a shortening of the absence and a saving in man-hours.

Labor Turnover in Hospitals

Personnel directors in hospitals have been aware for years of their elevated turnover rate. This has been explained by the low salaries offered, the increased amount of work per individual employee, the absence of fringe benefits competitive with industry, and the use of hospitals as training areas by persons new to work before moving elsewhere to better paid positions. If one believes in the analytic theory of occupational choice, then one feels that a person enters a profession, craft, trade, or occupation because of unconscious motivating forces. The activities and satisfactions of the job meet the needs —neurotic or otherwise—of the individual, and he finds himself happier doing one kind of work than another.

In any event, to develop a more effective recruiting program for one hospital, emphasis was given to the reasons for the acceptance of hospital positions.[18] A survey of five hospitals in New York revealed the following data: "Among the younger workers responding the average worker spent four years in the hospital field compared to seven years for the 35 to 49 age group and 10 years for the oldest group. . . . However, the average younger worker reports having worked in 2.1 hospitals prior to accepting his present job. The middle age group reports having worked at 3.3 hospitals previously, while the older group reports a history of 2.6 hospital affiliations. Approximately 75% of this oldest group have worked in industry almost 20 years before working in hospitals. They are the old whom industry has discarded." The study of the turnover group showed that the majority of those leaving after short periods had not finished primary school.

To continue to look into reasons for leaving, these were the stated causes for separation: poor attitudes of supervisors and co-workers, 24.2%; shifts and hours of work, 19.4%; number of days of work (five and one-half or more), 17.5%; insufficient help, being overworked, 9.9%; lack of benefits, 8.4%; red tape and disorganization, 5.3%; mental work and poor working conditions, 4.6%; lack of advancement and opportunity, 4.6%; contacts with sick patients, 3.8%; and frustration when patients die, 2.3%.

Although low pay allegedly is the reason for terminating one's employment, this item does not appear among the 10 given. The purpose of citing some of these data is to underscore another indication for the creation and execution of an employee health program. Such an activity, under imaginative and full-breadth direction, can work closely with the personnel department in resolving the problems weighing on employees which will lead to their voluntarily leaving. Through personal counseling or guidance in the seeking of professional help, psychotherapeutic or medical, the worker who feels that the only answer lies in new employment may gain sufficient insight to realize the role of conflict in his proposed move. He may remain and become a more productive and effective staff member.

A health service focused on symptom-relief solely is exercising but a fraction of its therapeutic potential. Through group discussions with management personnel, conferences on the techniques of working with people, and small meetings held in democratic fashion and in a permissive milieu, supervisors can be brought to an understanding of the relationship of their own personality deficits to employee dissatisfaction, high turnover rates, and lowered efficiency. This is a health service in orbit—not a sputtering feeble effort that leaves the launching pad only to fizzle into limbo. There are programs of this quality in industry that should be introduced into the hospital scene.

Essentials of Student Training Programs

Another strong reason for the establishment of employee health services is to aid the hospital in meeting the health requirements as laid down by the A. M. A. Council on Medical Education and Hospitals for the full spectrum of student training categories. With a specifically designed service these obligations can be met. The requirements, as listed, follow.

Internships.—"The hospital should be concerned with the intern's health during his period of service. Each intern should be given a thorough physical examination including a roentgenogram of the chest and routine laboratory studies at the beginning of and periodically as might be indicated during his internship. A member of the attending staff should be assigned the responsibility of acting as personal physician to the interns with a readily available consultation service provided by other members of the attending staff. The hospital should be willing to accept a reasonable share of the responsibility for the continuing care of long-term illness contracted by the intern directly in the discharge of his duties."

Medical Record Library Science.—There are no requirements stated regarding health of medical record librarians.

Medical Technology.—"Applicants shall be required to submit evidence of good health and successful vaccination, and a report of a medical examination should be a part of the students' records. This examination shall include a roentgen examination of the chest. Provisions should be made for medical care and hospitalization, when necessary, for a reasonable length of time. . . . All applicants should be required to submit a physical health report including record of vaccination. All students should be given a medical examination as soon as practicable after admission and this examination should include an x-ray of the chest."

Occupational Therapy.—"All applicants should be required to submit a physical health report including evidence of successful vaccination. All students should be given a medical examination under the supervision of the official school physician as soon as practicable after admission and this examination should include a roentgen examination of the chest."

Physical Therapy.—"It is desirable that qualitative standards with reference to academic performance, character, motivation and health be applied to candidates for admission."

Residencies and Fellowships.—There are no requirements stated regarding health of residents or fellows.

X-ray Technology.—"Applicants shall be required to submit evidence of good health and successful vaccination. All students shall be given a medical examination, as soon as practicable after admission, by a physician designated by the school. This examination shall include a roentgen examination of the chest. There shall be adequate periodic medical examination of the student."

In the report of the Council on Medical Education and Hospitals submitted by members of the House of Delegates of the A. M. A., a revision of the "Essentials of an Approved Internship" and the "Essentials of Approved Residencies and Fellowships" was requested. This will incorporate sections on "selection of interns" and "selection of residents," and in the former it states that "there should be confidence that the interns appointed have the high standards of integrity, motivation, industry, resourcefulness, health and basic medical knowledge necessary to take full advantage of the further educational experience offered." The same statement is made in connection with the selection of residents and fellows. From this it can be seen that additional emphasis is being given to the health status of these graduate students who technically are employees of the hospital.

The Ideal Program

What comprises an effective employee health program? All of the component parts given here need not be considered mandatory for all installations—small hospitals and large—but from those given a selection can be made which will best fit the needs of the institution. These are the elements of an ideal health service.

Estimation of the Work Capacity of Applicants for Work.—The following procedures are done in the preemployment examination: 1. Preplacement medical examination, with taking of medical and occupational histories, appraisal of health status by physical examination, and performance of special examinations. These may include audiometry, visual acuity battery by precision instrumentation, chest roentgenography (a photofluorogram may be taken on all personnel except those previously or currently exposed occupationally to ionizing radiation or those with excessive past exposure to diagnostic or therapeutic radiation—for these, a 14-by-17-in. film should be used), complete blood cell count or hematocrit determination and leukocyte count, urinalysis, serodiagnostic test for syphilis, personality inventory or psychological battery, electrocardiography, feces examination, blood type and Rh factor determination, tuberculin testing, Schick testing for young employees, and other examinations or consultations as indicated. After these are performed, a classification of health status is made as follows: 1, physically qualified for any position; 2, physically qualified for any position, but has minor defects; 3, physically qualified for special employment only, with one or more specifying restrictions, and 4, physically unqualified for position applied for. 2. Matching of physical and emotional capacities of applicant with physical and emotional requirements of job. 3. Interpretation of findings to applicant. 4. Recommendation made to personnel director.

Medical Preparation of Accepted Applicant for Work.—If the applicant is accepted for work, these further steps are taken: 1. Completion of subsequent or additional examination procedures. 2. Interpretation of additional results and need for medical observation or care. 3. Explanation of special occupational health hazards and clinical surveillance needed. 4. Orientation to services offered by employee health service. 5. Initiation of immunization program. This may include smallpox vaccination, poliomyelitis vaccination, typhoid-paratyphoid fever vaccination, tetanus toxoid immunization, diphtheria toxoid immunization (if indicated) for young employees, BCG vaccination (if indicated) for young employees, and influenza types A and B and Asian influenza vaccination. 6. Issuance of wallet card providing information on blood type and Rh factor, drug sensitivity status, medical radiation exposure record, record of immunizing injections, and statement on chronic disease, such as diabetes or convulsive disorder. 7. Issuance of occupational protective eyewear, as indicated by job. 8. Establishment of return visit schedule.

Maintenance and Improvement of Health Status of Employees.—The following procedures are included in the health-maintenance program: 1. Periodic medical reexaminations. These include post-illness, preretirement and prepromotion, reemployment, and annual or biennial examinations and preentrance examinations, if desired, on students in teaching centers. 2. Periodic health interviews and counseling. 3. Special examinations for certain personnel. These are done for executives in the health service or by a private physician, food handlers, radiation workers, laboratory workers exposed to volatile solvents or other toxic agents, and drivers of motor vehicles. 4. Health education program. A program providing for continuing health education may include meetings with groups of employees; procurement, distribution, placement, or showing of health education media (e. g., pamphlets, posters, exhibits, and motion picture films); and orientation meetings with personnel prior to initiation of a new health service activity. 5. Counseling for emotional problems. This may include a diagnostic interview and/or referral to psychiatrist, clinical psychologist, or psychiatric social worker. 6. Counseling for improved job relationships. This may include a diagnostic interview, a conference with the employee's supervisor and the employee, as indicated, and referral to the personnel director. 7. Leading of discussion groups among supervisory personnel in the area of human relations, ways of rectifying impaired work performance, and techniques of working with people. 8. Meeting with groups of managerial personnel for the resolution of administrative or personnel problems.

Medical Supervision of the Work Environment.—A healthful work environment may be maintained as follows: 1. Conducting of surveys for identification—by location, type, and ingredients—of potentially hazardous occupational exposures. This should also include determination of inadequacies in the physical environment, such as impaired illumination and dampness. 2. Determination of ingredients of unidentified but suspected toxic work materials. 3. Obtainment of consultant services of industrial hygienist. Procurement and measurement of samples of work room air often must be done. 4. Preparation and submission of recommendations regarding corrective measures or the installation of industrial hygiene engineering control devices in the form of local exhaust ventilation systems. This is done through joint consultation with an industrial hygienist. 5. Survey of sanitary facilities. This includes waste disposal facilities, sources of drinking water, food preparation areas, and washing facilities for employees. Recommendations on the correction of areas failing to meet accepted standards are then submitted. 6. Consultation with housekeeping department on insect and rodent control. 7. Supervision of ice-making equipment and ice-distributing systems. 8. Maintenance of clinical records. These should document completely all visits made to the employee health service or to clinics, clinical laboratories, the radiology department, and other services, on request or through consultation. 9. Utilization of clinical records. Statistical summaries are made to improve the health status of employees as indicated by epidemiologic interpretation.

Medical Care for Illness and Injury.—Both occupational and nonoccupational illnesses and injuries must be taken into consideration: 1. Occupational injuries. Complete medical care should be given for job-connected injuries, either through the health service or via consultation with specialists on the hospital staff. 2. Occupational illnesses. Complete medical care is also supplied for job-connected illnesses, again, either through the health service or via consultation with specialists on the hospital staff. 3. Nonoccupational injuries. Limited or emergency care will permit the employee, where possible, to finish his work shift. Then referral to local sources of medical care—of the patient's choice—may be made when the condition requires additional diagnostic procedures or prolonged therapy. 4. Nonoccupational illnesses. Again limited care may be given to permit the employee to finish his work shift, and referral may be made to local sources of medical care—of the patient's choice—for conditions requiring additional diagnostic procedures or prolonged therapy.

Services to Management.—Consultant service on the selection and operation of hospitalization insurance or on medical major insurance programs is useful. Consultant service on industrial relations criteria of efficiency—absenteeism, labor turnover, and effective work performance—may also be given.

Comment

Obviously, the limited health service of a small hospital will not have need for the enriched program offered above. All of the major activities, however, of an energetic service have been given, not only for possible inclusion in a new employee health program but also to familiarize program planners with those activities which are to be found in the more productive programs.

The creation of an employee health program in a hospital is a logical step in the provision of a fringe benefit to underpaid and frequently aged and disabled workers. A well-planned and well-executed personnel health program can, through intelligent use of documented clinical records, provide information on the health status of America's hospital employees, including physicians, nurses, paramedical personnel, and clerical, maintenance, and custodial workers. This would provide a solid body of knowledge in place of the current rather thin supply of pertinent information.

With a properly established health service unit, with its own physical facility, its own clinical records, and its especially assigned personnel, the custom of corridor consultations can be eliminated from the hospital scene. Physicians are uncomfortable in attempting—apart from emergency or disaster situations—medical care outside the usual milieu of a consultation room or treatment room. A better service will result with the creation of a health service, and many of the hospital personnel problems can be resolved when an adequate health service is extended to the area of interpersonal relations among hospital employees. Health maintenance of the hospital staff is perfectly feasible, and, when medical practice is removed from the hallway, the rest room, the doctor's lounge, and the lobby, the employees themselves and their supervisors will realize the worth of this progressive step.

A creditable service can be rendered by the general practitioner interested in executing these functions in small hospital installations. The development of a health service for hospital employees is urgently recommended for consideration by all hospitals, medical research laboratories, medical centers (a centralized employee health service can serve individual components of a medical center), and large outpatient clinics, so that this heretofore neglected personnel group can share the advantages of progressive contemporary occupational medicine.

Summary

The hospital industry of the United States, comprising 1,375,000 employees, an annual payroll of 4 billion dollars, and an annual expenditure of 6 billion dollars, offers little to its employees in the way of preventive medical programs at work. The hospital worker—frequently underpaid, older, and physically marginal—has not shared in on-the-job health services as have employees in American manufacturing industry.

The American Medical Association and the American Hospital Association have outlined guiding principles for health services in hospitals which can aid in the creation of occupational health programs. Health services for hospital employees are needed and have been provided in some of the larger institutions of the Northeast, some dating back as far as 20 years. Programs have been encountered in large psychiatric hospitals, Veterans Administration facilities, and research establishments where hazardous work exposures exist.

The needs for medical surveillance in the hospital situation are multifold and relate to the built-in hazards of the operation of patient care. These hazards include infectious disease (tuberculosis, Q fever, homologous serum jaundice, staphylococcic infections, and other bacterial, viral, rickettsial, parasitic, and fungus disorders), contact dermatoses, ionizing radiation, and patient-induced trauma and other injuries. Occupationally incurred illnesses and injuries have led to the presenting and contesting of claims before workmen's compensation boards and commissions.

The utilization of physically disabled employees in hospitals indicates further the need for a health service to assure accuracy in their placement and job adjustment. There is some evidence to indicate that hospital employees overuse hospitalization insurance, and a health service could exercise some control in this area.

Because of a high labor turnover in hospitals, an imaginative employee health program could study the reasons for voluntary separation of employees and, through close liaison with the personnel director and the managerial staff, endeavor to identify the causes of excessive turnover. Through group discussion or individual counseling, it could lower this costly budget item.

The A. M. A. Council on Medical Education and Hospitals has outlined specific health requirements for interns, medical technologists, occupational therapists, physical therapists, and x-ray technicians, and the presence of a health service would allow compliance with these requirements.

An ideal program is built in the general areas of (1) estimation of the work capacity of applicants for work, (2) medical preparation of accepted applicants for work, (3) maintenance and improvement of the health status of employees, (4) medical supervision of the work environment, (5) medical care for illness and injury, and (6) services to management.

References

1. Fortune Directory of 500 Largest U. S. Industrial Corporations, Fortune (supp.), Aug., 1958.
2. Felton, J. S.: Student and Employee Health Services in Medical Centers—Results of Survey, in Proceedings of the 35th Annual Meeting of the American College Health Association, Baltimore, April 25-27, 1957, Bulletin 37, pp. 21-25, Nov., 1957; Unpublished data.
3. Fringe Benefits: Average Hourly Cost per Employee (for Northern Ohio Firms Surveyed by Associated Industries of Cleveland), Steel **141**:54 (Dec. 2) 1957.
4. Feeney, E., and Britten, S. A.: Active Tuberculosis in Navy Nurses, 1941-1950, U. S. Armed Forces M. J. **5**:27-46 (Jan.) 1944.
5. Reid, D. D.: Incidence of Tuberculosis Among Workers in Medical Laboratories, Brit. M. J. **2**:10-14 (July 6) 1957.
6. Workmen's Compensation Acts: Tuberculosis as Occupational Disease of Nurse, Medicolegal Abstracts, J. A. M. A. **164**:93-94 (May 4) 1957.
7. Trumbull, M. L., and Greiner, D. J.: Homologus Serum Jaundice: Occupational Hazard to Medical Personnel, J. A. M. A. **145**:965-967 (March 31) 1951.
8. Bass, J. A.; Stinebring, W. R.; Willard, C.; and Felton, H. M.: Epidemiologic Study of Hospital Outbreak of Micrococcic Infections, J. A. M. A. **166**:731-734 (Feb. 15) 1958.
9. Blair, J. E., and Carr, M.: Staphylococci in Hospital-Acquired Infections, J. A. M. A. **166**:1192-1196 (March 8) 1958.
10. Ministry of Health: Sensitization of Nursing Staffs to Antibiotics, Lancet **2**:33-35 (July 4) 1953.
11. Ritvo, M.; D'Angio, G. J.; and Rhodes, I. E.: Radiation Hazards to Nonradiologists Participating in X-ray Examinations, J. A. M. A. **160**:4-10 (Jan. 7) 1956.
12. Barrett, C. M.: Radiation Hazards in Practice of Radiology, Radiology **63**:400-406 (Sept.) 1954.
13. Brucer, M.: Radioisotope Hazards and Protection in Hospital, J. A. M. A. **147**:1745-1751 (Dec. 29) 1951.
14. Kaplan, E., and Fields, T.: Precautions That Pathologists Should Take in Handling Bodies That Have Received Radioisotopes, editorial, Am. J. Clin. Path. **25**:682-683 (June) 1955.
15. Jansen, G. T., and Curtis, A. C.: X-ray Exposure in Dermatology Personnel, A. M. A. Arch. Dermat. & Syph. **73**:66-68 (Jan.) 1956.
16. Gonda, R. F.; Marsh, J. A.; and Louis, I. W.: 565 Industrial Compensation Decisions, Cleveland, Occupational Hazards Magazine, the Industrial Publishing Corporation, 1957, p. 14.
17. Reference 16, p. 22.
18. Schoenfeld, H.: Why People Work in Hospitals, Hospitals **26**:60-62 (Dec.) 1952.

A complete list of references, including 25 additional references, may be obtained from the author.

THE PROBLEM BACK

John E. Kirkpatrick, M.D., San Francisco

Pain in the back is the most common single reason given for occupational disability, and it is generally ascribed to actual injury to the vertebral column. The workman does not have to have any witnesses; he may neglect to report an occurrence to his employer, or he may think back to some indefinite date within one year to establish the basis for a claim of a work injury. An individual educated in legal and medical matters by such an experience may become a repeater, and for some this becomes a way of life. None of the rheumatic diseases have ever been created by slight or severe mechanical trauma in experimental animals or human beings. Many improbable medical decisions have been made by lay commissions in ignorance or disregard of this fact. It is believed that closer study and more precise diagnosis of back complaints will alter the statistics in this branch of occupational medicine.

The effect of significant actual trauma on the back is not difficult to diagnose, and the treatment is well standardized, whether medical, surgical, neurological, orthopedic, or a combination of these. Temporary aggravation of preexisting back conditions or emotional attitudes is a topic for another essay and is purposely omitted.

Factors in Trauma to the Back

One example of significant trauma should suffice to illustrate this: Suppose a fracture of lumbar transverse processes occurs in which the continuity of the bone is disrupted, the lumbar muscles and ligaments attached thereto are torn and disrupted, and, often, a palpable hematoma forms. Here then is severe spinal trauma.

What is the expected course of tissue repair? It progresses steadily toward healing with restoration of continuity of bone, muscles, and ligaments. Some scar tissue may form to complete the restoration of continuity. After an injury of this kind, it is possible to predict an end to the disability. Here is a severe injury of the back which does not result in chronic traumatic myositis, fibrositis, arthritis, or granulomatous inflammation.

If, in addition, a spinal joint is torn asunder, then a traumatic arthritis may, and often does, result. It should be pointed out that it takes severe and obvious actual trauma to disrupt a spinal joint, and it is usually demonstrable by x-ray. Similarly, severe trauma is necessary to cause a disruption of a healthy normal spinal muscle or ligament, either in continuity or from its attachments. The course of traumatic arthritis of a disrupted spinal joint is toward healing by bony bridging and ankylosis, not toward further deterioration and chronicity.

Let us consider the dogma of "wear and tear," so-called microtrauma, as a cause of osteoarthritis of the spine. All normal human beings walk erect and use the spine daily in a multiplicity of ways. This disease affects women about three times as often as men and appears in the latter years of life; it does not affect the entire human race, but only about 7 to 10%. It is not found any more often in one type of occupation than in another. The cause is still unknown, and although it will be discovered someday it will not be found to be due to microtrauma, or wear and tear. No one has ever reproduced it by actual mechanical trauma either in experimental animals or in man.

Some of the more common forms of rheumatic diseases which affect the spine during the years of employment are fibrositis, myositis, bursitis, gout, and rheumatoid spondylitis. Even these affect only a small percentage of the 11 million Americans who are afflicted with arthritis and related rheumatic diseases. Some of these conditions run a course independent of treatment, and some of the effects of these diseases are reversible without treatment. Most of them have a tendency to recur at more or less frequent intervals.

Causes of Chronic Back Disorder

The so-called problem back occurs most often when the element of chronicity arises. A case of this kind must have its inception with the first visit to the physician. The history of the occurrence related by the patient may sound plausible, and too often the physician makes no effort to find out the body mechanics and physical effects of the occurrence which could have a bearing on the patient's complaints. The patient has made his diagnosis already on the basis of what he believes happened and why he has symptoms in the back. Almost in the next breath the physician tells him that he has "strained his back," and if the patient should state that he has a pain radiating down one of his legs the doctor is quick to add that he "must have a disk." The conclusions of the patient, and of the doctor, are then quickly transferred to a Doctor's First Report of Work Injury blank and sent to an insurance company. No matter what is found in the future to controvert this original document, it is always staring one in the face during the period of litigation.

Read in the Symposium on Occupational Medicine for the Private Practitioner before the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

In the absence of a reasonable or provable description by a patient of a significant traumatic incident, after adequate questioning about the physical and mechanical details of the alleged accident or occurrence it is important to know if any similar symptoms have been noted by the patient prior to this occurrence, if he has received any prior compensation or award of disability for back trouble, or if prior treatment for back symptoms has been given. The patient's work history, social and economic background, and his mental attitude toward the incident are important to discover.

When back symptoms with prolonged disability occur, the initial quick diagnosis of "acute back strain" becomes suspect. Chronic back complaints are most commonly due to disease, structural abnormality, environmental conflicts, emotional attitudes, or a combination of one or more of these conditions.

What, then, does one look for in a patient who states he felt a pain in his back while doing work in which he has been engaged regularly for months or years? It is a human trait to believe that pain is caused by some act that is being performed or by some act that has been performed in the past and thought back to as a likely cause. The patient philosophizes that there was never anything the matter with his back before, so why should there be now, and arrives at his own diagnosis that it must have been caused by the incident. It would never occur to him that there could be an intrinsic cause for his pain. It is here that the doctor can make his first mistake and go on record as substantiating the patient's description of the occurrence, as well as agreeing with the patient's diagnosis.

Here we find the primary element of a wrongful claim: a quick, totally inadequate history accepted without any attempt to determine if any significant actual trauma did occur which could cause the complaints.

Some of the most common reasons for this situation can be as follows: economic factors, in which both the patient and his doctor are involved; antagonism, such as belief that the boss does not like him; anxiety, or fear of losing his job; laziness, with unemployment insurance to fall back on, or a wife who can work or is working; health and welfare fund pressure, including actions to keep the fund from bearing any expense which can be shoved off on to workmen's compensation carriers; antisocial factors, as belief that the economic system is against him and, paradoxically, owes him a living; psychic factors, such as a true or malingering hysteria; or desire to appear a hero, as after an accident where the patient describes how he helped to save other workmen from injury, thereby injuring himself, or saved a piece of valuable machinery by injecting himself into the situation in the "nick of time," saving the machine but injuring himself.

Compensation Factors

During the recent 50 years of the industrial age, monetary compensation for disability has been broadened progressively to cover any symptom a workman may have if he can think of an occurrence or exposure. The workman does not have to have any witnesses; he may neglect to report an occurrence to his employer, or he may think back to some indefinite date within one year to establish the basis for a claim of a work injury. During this industrial era, and before unemployment compensation disability welfare plans and private health insurance plans were so widespread, a traumatic etiology concerning back symptoms was progressively promulgated by labor management and tacitly supported by a quick medical report without a detailed study of the case, with the worker awarded compensation by a lay commission.

There have been so many improbable medical decisions made by lay commissions during this era that now, when almost every workman is covered by health and welfare insurance, it is a running battle between industrial insurance carriers and health and welfare carriers to place the blame for the problem back. During the legal delay, the patient has become confused, is penalized by an unjustifiable wage loss, suffers a progression of untreated diseases, develops personality and social disorders, and becomes almost impossible to rehabilitate.

When such a case eventually becomes a matter for an award of permanent disability, the monetary gain does not always effect a cure. Such an individual, after being so well educated in legal and medical matters, often becomes a repeater, and, for some, this becomes a way of life. One such experience often makes him aware of the fact that, after litigation is all over, he did not have a traumatic injury after all and now all he has to do to get paid for a few weeks off from work is claim his back hurts as a result of some trivial incident on the job, regardless of whether he has proof of this occurrence. Soon he has another claim on the way based on recurrence, aggravation, or exacerbation of a preexisting disability.

Summary and Conclusions

None of the rheumatic diseases—fibrositis, myositis, bursitis, gout, rheumatoid spondylitis, rheumatoid arthritis, and osteoarthritis—have ever been created by slight or severe mechanical trauma in experimental animals or in human beings. Recent surveys reveal that 7 to 10% of the population of the United States is afflicted with these diseases. These diseases are associated with dysfunction of the reticuloendothelial system, often with the development of granulomatous inflammations in the musculoskeletal system in response to specific inanimate (chemical or physical) agents, the more common being collagen, rheumatoid factor, cholesterol, and uric acid, singly or in mixed lesions.

The fact that an alleged accident brings a patient to the physician and after physical examination he is found to have one of these diseases should not influence the physician to pass up the opportunity to do him a worthwhile service by making an accurate diagnosis and so informing the patient, instead of reporting a claim of an alleged occurrence as being the reason for his back complaints and disability.

If a proper diagnosis of back complaints is made, I believe the statistics in regard to back injury in California will be altered. At the present time, in California, one-fifth of all cases of lost time are alleged to be due to back injury. It is the most common single cause of disability and loss of productive capacity.

The effect of significant actual trauma on body tissue is not a mystery insofar as its course is concerned. The course of recovery from a simple bruise or a major disruption of body tissue, except the central nervous system, progresses toward healing, resulting either in complete restoration of function or in some residual impairment of function by deformity or scar tissue, but without recurrence. Trauma does not produce a persistent stimulative effect on the cells of the reticuloendothelial system. The course of the granulomatous inflammation is toward chronicity and recurrences. These lesions may be reversible, may end in scarring, or may cause total progressive dissolution of tissue or total destruction of the individual.

516 Sutter St. (2).

HAZARDS OF THERAPY IN RESPIRATORY DISEASE

William B. Sherman, M.D., New York

In the treatment of obstructive pulmonary emphysema and bronchial asthma it is important to avoid certain procedures that may further handicap respiratory mechanisms already on the verge of exhaustion. Persistent respiratory insufficiency is in itself a dangerous state. Drugs that reduce anxiety, relieve insomnia, and suppress coughing may be physiological luxuries which the patient cannot afford; they must be chosen with care and given in small or average, rather than large, doses. Profound narcosis with any drug is dangerous in severe asthma or in emphysema complicated by respiratory infection. For cyanosis the rational therapy is oxygen, but patients receiving it must be watched closely for signs of carbon dioxide narcosis. Violent reactions to penicillin or even to such simple drugs as aspirin are especially likely in patients with asthma and may occur in many patients with emphysema. Patients with these diseases urgently need treatment directed at the underlying condition.

Since space permits discussion of only a few aspects of respiratory disease, I shall devote it primarily to the hazards involved in the treatment of respiratory insufficiency as seen in obstructive pulmonary emphysema and bronchial asthma. These two diseases exemplify well some of the problems peculiar to the respiratory system.

Respiratory Insufficiency

In both asthma and emphysema, the respiratory defect is ventilatory; obstruction of the air passages and loss of normal elasticity of the lung prevent adequate flow of air to and from the alveoli. The respiratory insufficiency of emphysema becomes acute during respiratory infections, when the increased secretions further block the already inadequate airways. In asthma, the obstruction is due in part to spasm of bronchial muscle and edema of the mucosa, but in those cases that terminate fatally, the most obvious pathological lesion is widespread plugging of the smaller bronchi and bronchioles by tenacious mucus.

Under these conditions of disease, the natural protective and adaptive mechanisms of the respiratory system become inadequate and themselves play a large part in the symptoms of the patient. The increased respiratory stimulus as the respiratory center strives to compensate for inadequate aeration of the blood is manifested as distressing dyspnea, which prevents sleep and keeps the patient in a state of restless anxiety. The cough, less effective because of decreased air flow, is unable to dislodge the overwhelming accumulation of secretions and itself often contributes to the dyspnea.

Persistent respiratory insufficiency due to emphysema complicated by acute infection, or to status asthmaticus, is a dangerous state. The fact that the

---

From the Department of Medicine, Columbia University College of Physicians and Surgeons.

Read in the Panel Discussion on a General Review of the Hazards Encountered in the Use of Certain Therapeutic Agents before the General Scientific Meetings at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

patient has previously recovered from similar attacks usually leads all concerned to a false sense of security, and rapidly fatal respiratory failure may leave the physician surprised and the family unaware of the danger. Patients with these diseases urgently need treatment directed at the underlying condition; measures which merely relieve the symptoms often do so at the expense of suppressing the already inadequate protective mechanisms and may actually increase the danger of respiratory failure.

Use of Drugs

Most of these patients require sedatives, particularly when sleep is impossible and restlessness is increasing the oxygen need. As an adjunct to more fundamental treatment, they are of considerable value. However, their use involves two related hazards: (1) the depression of the already fatigued respiratory center and (2) the possibility that the *exhausted and sedated patient may be suffocated* by his own secretions. The first risk depends on the choice of drugs, the second on the doses used.

The most effective drug for the relief of dyspnea and anxiety is morphine. However, its efficacy results largely from marked depression of the respiratory center and partly from a false sense of well-being. The only local affect on the bronchi is an unfavorable one of increasing muscle spasm. It is as dangerous as it is effective, and, the more serious the condition of the patient, the greater is the danger. No doubt its use in the past has contributed to a fatal outcome in many cases of asthma. Several authors have suggested that it is the principal cause of death in asthma. However, avoidance of its use has not solved the problem, and other sedatives are not entirely free of risk.

With the increasing reluctance to use morphine in asthma, meperidine (Demerol) hydrochloride has become popular as a substitute. Pharmacological studies suggest that its use is more rational. The depression of the normal respiratory center is considerably less than with morphine, and some relaxation of spastic bronchi may be expected. In severe status asthmaticus, it is occasionally useful, when used sparingly in conjunction with drugs relieving bronchial obstruction, but it should not be used as the sole treatment. In some cases, two or three doses of 50 mg. each in the course of a few hours have produced serious respiratory depression and, occasionally, apparently contributed to a fatal outcome. When such respiratory depression is observed, it can usually be combated effectively by intravenous injection of nalorphine (Nalline) hydrochloride.

In acute asthmatic attacks of short duration, meperidine can be used with little risk of respiratory failure. However, in these milder cases caution should be observed because of the danger of habituation. Asthma is important among the diseases in which treatment leads to addiction.

There are many sedatives which can be used in ordinary doses without significant risk of respiratory depression. The barbiturates and chloral hydrate are the most frequently used; paraldehyde, alcohol (ethanol), and ether by rectum are relatively safe in regard to respiratory depression but are open to other objections. The various tranquilizing drugs are also valuable and relatively safe.

Any of these sedatives should be given in small or average, rather than large, doses, with administration repeated carefully as necessary to produce relaxation and light sleep. Profound narcosis with any drug is dangerous in severe asthma or in emphysema complicated by respiratory infection.

Deaths from asthma which follow the use of barbiturates are usually due to gross overdosage based on a misconception of the nature of the illness. As the patient fails to respond to the usual drugs and becomes increasingly tense and anxious, the psychosomatically minded physician may become convinced that the emotional state is producing bronchospasm through a neurogenic mechanism and that *release of tension is the most pressing problem.* Because of the obvious seriousness of the condition, large doses of amobarbital (Amytal) sodium or phenobarbital (Luminal) sodium are injected intravenously in a heroic effort to eliminate the emotional factor. Unfortunately, the patient with this type of asthma is suffering more from an accumulation of mucus secretions than from bronchospasm and, in his anesthetized state, dies from asphyxia without further efforts to expel the obstructing material. Like any drowning man, he cannot afford the luxury of sound sleep until the danger is removed.

What has been said of general sedatives applies to some degree to the inhibition of cough. While frequent cough may be distressing and ineffective and may aggravate the dyspnea, it is basically a protective mechanism and mitigation with small doses of codeine or milder agents is preferable to complete suppression.

Need for Oxygen

In severe respiratory insufficiency, oxygen is often needed for the relief of cyanosis. When the anoxia is severe and of long standing, even this rational form of therapy involves some risk, more often in emphysema than in asthma. The anoxia in such cases is usually associated with carbon dioxide retention. As the condition persists, the respiratory center becomes less sensitive to the carbon dioxide tension of the blood and the stimulus for respiration depends largely on oxygen lack. As this oxygen deficiency is corrected by therapy, the respiration is depressed and the carbon dioxide level continues to rise. When this level reaches 85-100 vol. %, the carbon dioxide has a narcotic affect and coma ensues. An already elevated carbon dioxide tension at the beginning of treatment gives warning of this hazard. If facilities for blood carbon dioxide analysis are not available, patients with severe and prolonged anoxia should be watched carefully when oxygen treatment is begun.

This carbon dioxide narcosis may be prevented or corrected by administration of oxygen with a positive-pressure respirator, which serves to maintain adequate pulmonary ventilation so that carbon dioxide is eliminated as oxygen is taken up.

Comment

The hazards involved in the use of steroids will be discussed elsewhere. In respiratory disease, particularly bronchial asthma, when the steroids are used for periods of only a week or two the hazards have proved to be far less than was feared a few years ago.

In regard to the use of antibiotics, especially penicillin, the hazards are increasingly apparent. The incidence of severe anaphylactic reactions to penicillin is unusually high in allergic and asthmatic patients. Also, the development of this type of sensitization is apparently greater after sporadic injections at intervals of weeks or months, which are often utilized in the treatment of recurrent asthma or bronchitis.

Finally, it should be remembered that patients with asthma and many of those with emphysema are allergic persons who may have violent allergic reactions to such simple drugs as aspirin.

60 E. 58th St. (22).

* * *

GASTROINTESTINAL HAZARDS ENCOUNTERED IN THE USE OF CERTAIN THERAPEUTIC AGENTS

GENERAL REVIEW

Gordon McHardy, M.D., New Orleans

The gastrointestinal tract is exceptionally susceptible to untoward reaction to certain therapeutic agents. Considerable evidence has been presented to indicate that the clinical picture of acute intrahepatic obstructive jaundice results from certain agents commonly used in gastrointestinal dysfunction and disease. The inference is that wide usage, which condones the risk of hepatotoxicity, is unfortunately prevalent. Stimulation of the appetite by iproniazid does not justify risking hazardous dosage. Approximately 76% of the population of the United States have been treated with antibiotics. The superinfection from disturbance of the normal bacterial flora permits emergence of pathogenic organisms. The resultant severe pseudomembranous enterocolitis, if not suspected and properly managed, is often fatal. Other untoward gastrointestinal reactions observed include atypical anticholinergic-induced achalasia, esophageal obstruction resulting from bulk laxatives, esophagitis from antibiotics, acid-base imbalance from intensive antacid therapy, gastritis from gastric irradiation from duodenal ulcer, and carbohydrate-induced dumping syndrome.

The most widely used and probably most effective therapeutic agents today have been responsible for dramatic gastrointestinal reactions that have introduced new entities into the medical literature. Thiazine-induced cholostatic jaundice,[1] antibiotic-resistant staphylococcic pseudomembranous enterocolitis,[2] and steroid-activated or steroid-produced peptic ulcer[3] have each offered frustrations to the therapist whose healing agent boomeranged so as to produce another illness.

The gastrointestinal tract is exceptionally susceptible to untoward reaction to certain therapeutic agents.[3] Often, the drug has a specific gastrointestinal indication; in other instances, the reaction of the digestive tract has been used as an index of toxicity or of effective dosage, as, for example, in the case of digitalis, colchicine, or atropine. The present discussion will be limited to the more significant and more frequently encountered hazardous gastrointestinal reactions to agents of definitive therapeutic value in the field of gastroenterology. These agents have been classified according to two gradations of severity. Among the more hazardous have been included those agents whose effects persist after discontinuance of the therapy and excretion of the drug; these are associated with appreciable illness and potential death (table 1). The less severe reactions have been classified as symptomatic hazards, since the untoward reaction subsides on withdrawal or excretion of the drug; illness is minimal, and death is probably never a direct result (table 2).

From the Browne-McHardy Clinic and the Department of Medicine, Louisiana State University School of Medicine.

Read in the Panel Discussion on a General Review of the Hazards Encountered in the Use of Certain Therapeutic Agents before the General Scientific Meetings at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

Severe Gastrointestinal Therapeutic Hazards

Jaundice.—Considerable evidence has been presented to indicate that the clinical picture of acute intrahepatic obstructive jaundice results from two agents commonly used in gastrointestinal dysfunction and disease. Jaundice accompanied by an elevated level of alkaline phosphatase in the serum, negative result of serum flocculation tests, and evidence of bile thrombi and lymphocytic infiltration of the portal tracts on needle biopsy of the liver is considered the result of direct toxic action of arsenic on the intrahepatic biliary ducts—perhaps a sensitivity reaction to chlorpromazine. The exact pathogenesis of the jaundice due to chlorpromazine has not been established. Additionally, promazine and prochlorperazine have been indicated as icterogenic agents. Reports of iproniazid-induced hepatic involvement have added another complexity.

TABLE 1.—*Severe Therapeutic Gastrointestinal Hazards*

Manifestation	Agent	Indication
Jaundice	Chlorpromazine	Sedation
	Iproniazid	Stimulation of appetite
	Arsenicals	Amebiasis
Enterocolitis	Antibiotics	Colonic infections Amebiasis Preparation of intestine
Ulcerogenic disturbances		
Hemorrhage	ACTH	Ulcerative colitis
Perforation	Adrenal steroids	Hepatic disease Collagen diseases
Serum hepatitis	Needle	Parenteral therapy
	Blood	Replacement of blood

The agents responsible for this reaction are not therapeutically essential. Other amebicides are as effective as the arsenicals, which, fortunately, are not widely used. Antiemetic agents without the thiazine radical are available. Chlorpromazine, however, is reputed by its manufacturer to have reached over 10 million patients in the United States alone, the inference being that such wide usage condones the risk of hepatotoxicity. Stimulation of the appetite by iproniazid (Marsilid) does not justify risking hazardous dosage.

Enteritis.—Approximately 76% of the population of the United States has been treated with antibiotics, and in 9% a resistant organism has developed.[4] Enterocolitis[5] from antibiotic-induced staphylococci (micrococci) may be manifested merely by diarrhea, produced by elaboration of the enterotoxins, or it may progress to severe enterocolitis and occasionally to fatal fulminating episodes of pseudomembranous ulcerative colitis. Bacteriological studies have established the presence of staphylococci resistant to the antibiotic used as the pathogen; these have been found after use of almost all the antibiotics. The superinfection from disturbance of the normal bacterial flora permits emergence of pathogenic staphylococci. The resultant severe pseudomembranous enterocolitis, if not suspected and properly managed, is often fatal.

This induced illness could be considered a necessary evil if antibiotics were used only when adequately indicated. Effort should be expended toward its prevention by cautious use of these drugs and by close observation during their administration to detect resistant organisms before the reaction becomes severe.

Ulcerogenic Agents.—Development or activation of peptic ulcer, with its complications of hemorrhage and perforation,[6] has occurred too frequently during administration of ACTH, the adrenal steroids, and the Rauwolfia compounds to be considered merely coincidental.[7] This hazard seems greater with the steroids. Gastric hypersecretion, adrenocortical hyperfunction, and lowered tissue resistance have each been incriminated as the mechanism, but careful appraisal has failed to establish the precise ulcerogenic effect of these agents.

The exact relationship of the development of ulcer to the medication, the mode of pathogenesis, and the true frequency as compared to the over-all incidence of peptic ulcer are difficult to determine. Yet, the prevalence of reported, as well as unreported, cases forbids our disregarding the obvious dangers inherent in indiscriminate, unduly prolonged, and excessive administration of the steroids. Prophylactic measures to control gastric hyperacidity should be used whenever administration of steroids is indicated.

Only infrequently, and then with larger doses of the Rauwolfia compounds, has significant gastric hypersecretion occurred with ulcerogenic possibilities. Rauwolfia-induced hypersecretion[8] has been attributed to local action, endogenous secretion of histamine, and central suppression of inhibitory sympathetic neural impulses.

TABLE 2.—*Symptomatic Therapeutic Gastrointestinal Hazards*

Manifestation	Agent	Indication
Fungal infection .... (moniliasis, stomatitis, esophagitis, anoproctitis)	Antibiotics	Colonic infections Amebiasis Preparation of intestine
Salmonellosis activation	Antibiotics	Colonic infections Amebiasis Preparation of intestine
Gastric hypersecretion..	Rauwolfia compounds	Sedation
	ACTH	Hepatic disease
	Adrenal steroids	Ulcerative colitis Collagen diseases
Delayed gastric emptying	Anticholinergics	Peptic ulcer
Masked hemorrhage and perforation	Anticholinergics	Peptic ulcer
Paralytic ileus	Anticholinergics	Peptic ulcer
Constipation	Anticholinergics	Peptic ulcer
Impaction	Barium	Diverticulosis
	Bulk preparations	Constipation
Vitamin deficiency	Antibiotics	Intestinal infection Amebiasis Preparation of intestine
Nausea and vomiting...	Sulfonamides	Intestinal infection
Biliary dyskinesia	Opiates	Pain

Serum Hepatitis.—Viral serum hepatitis is identified with the syndrome of serum hepatitis that develops six weeks to six months after parenteral inoculation of virus-contaminated blood or its products or after use of a contaminated needle.[9] Transfusions are frequently given to patients with gastroenterologic complaints in whom acute and chronic loss of blood necessitates replacement. Every effort should be made to exclude blood donors who represent potential vectors. Unnecessary transfusion should be avoided, and parenteral equipment should be carefully sterilized.

Symptomatic Gastrointestinal Therapeutic Hazards

Fungal Infections.—Still extremely divergent are opinions [10] regarding the pathogenicity that usually results from organisms indigenous to man wherein lowered resistance due to altered bacterial flora by antibiotic therapy permits invasion by Candida albicans, Aspergillus, Penicillium, Cryptococcus, and Geotrichum to result in intensive involvement of the tongue, buccal mucosa, pharyngeal esophagus, and perianal area. Nystatin [11] may be an effective prophylactic and therapeutic antifungal agent, but I have found undecylenic acid, local measures, anesthetic agents (procaine), anti-inflammatory solutions (steroids) with dilute iodine to be more efficient.

Activation of salmonellosis has been reported as a complication of the use of tetracycline, to which most strains of Salmonella are relatively resistant.[12]

Gastric Hypersecretion.—Gastric hypersecretion may occur during excessive, prolonged, or parenteral administration of Rauwolfia compounds in the sensitive patient.[13] That hypersecretion ever results from administration of ACTH or adrenal steroids has been debated.[3] In any event, since the use of both agents has been associated with hypersecretion they are best avoided in the presence of peptic ulcer and its complications.

Delayed Gastric Emptying.—Delay in gastric-emptying, as a result of anticholinergic-induced decreased gastric motor activity, may become clinically significant in the presence of partial pyloric obstruction,[14] wherein retention produces a vicious cycle of retention-stimulated gastric secretion. This has also been observed with belladonna alkaloids.[15] Judicious use of these agents should prevent such occurrence. Large doses, however, in the absence of pyloric disease, have resulted in retentive phenomena.

Hemorrhage or Perforation.—Hemorrhage from a peptic ulcer may occur during anticholinergic therapy and defy recognition. Hemorrhage may be concealed when the expected vasomotor response to the vagal-acting drug is misinterpreted but is actually the result of loss of blood. Perforation may also ensue, but the pain may be eliminated as a premonitory sign of this complication. Although unusual, these complications occasionally develop. Furthermore, protracted bleeding has been observed after continued use of anticholinergics during bleeding episodes.

Paralytic Ileus.—The paralytic ileus, accentuated by administration of anticholinergics during treatment of acute pancreatitis, may inhibit motility to a disturbing degree in the preoperative and postoperative periods. This disturbance, with associated curtailment of motility and inhibition of gastrocolic and defecation reflexes, has produced a significant degree of constipation and, at times, severe impaction.

Vitamin Deficiency.—Vitamin deficiencies are most likely to occur in patients who have received prolonged antibiotic or sulfonamide treatment, which reduces intestinal bacteria that normally produce vitamin K and several members of the vitamin B-complex group. Significant hypoprothrombinemia may be a true hazard should the chemotherapy be a preoperative measure for colonic resection.

Nausea and Vomiting.—Nausea and, occasionally, vomiting have resulted from administration of sulfonamides.[16] Abdominal pain as the result of administration of chlorpromazine has also been reported.[17]

Biliary Dyskinesia.—During administration of opiates, biliary dyskinesia and suppression of hepatic function, with delayed metabolism of opiates by a diseased liver, are often overlooked hazards of these drugs in the preoperative and postoperative periods in the patient with jaundice.

Other Hazards.—Other untoward gastrointestinal reactions observed include atypical anticholinergic-induced achalasia, esophageal obstruction resulting from bulk laxatives, esophagitis from antibiotics, acid-base imbalance from intensive antacid therapy, gastritis from gastric irradiation for duodenal ulcer, and carbohydrate-induced dumping syndrome. Dietary carotenemia probably has little significance if not erroneously diagnosed as jaundice. Diarrhea is not an unusual consequence of most antihelminthic measures. Obstruction as a result of energetic treatment for ascariasis is a severe and, at times, fatal reaction.

Such diuretic aids as the various carbonic anhydrase inhibitors, the ammonium resins, and ammonium itself are hazardous in impending hepatic coma, as are efforts to enforce a high-protein diet. Development of pancreatitis during administration of adrenocortical hormones has been an objection to steroid treatment of pancreatitis. Diverticulitis has also been observed as a fairly frequent complication of antibiotic therapy. Mineral oil has been said to affect absorption of vitamin A.

Therapeutic procedures, such as indwelling duodenal tubes, have resulted in erosive esophagitis; the Sengstaken-Blakemore tube has precipitated esophageal ulceration; and the Miller-Abbott tube, improperly inflated, has caused pressure necrosis, with perforation, in the small intestine. The esophageal dilator has sometimes perforated the esophagus.

Summary

The high efficacy of many gastroenterologically applicable therapeutic agents is marred by toxicity. Adequate evaluation of therapeutic demand should precede the use of agents recognized as hazardous so as to preclude the indictment of doing more harm than good. Knowledge of such side-effects and the ability to recognize and cope with them intelligently are as essential as recognition of indication, mode of administration, and dosage.

3636 St. Charles Ave. (15).

References

1. Brick, I. B., and Buckley, S. V.: Prolonged Jaundice (Over Three Months) Occurring During Chlorpromazine Administration, Gastroenterology **33**:192-201 (Aug.) 1957.
2. Newman, C. R.: Pseudomembranous Enterocolitis and Antibiotics, Ann. Int. Med. **45**:409-444 (Sept.) 1956.
3. Kirsner, J.: Drug-Induced Peptic Ulcer, Ann. Int. Med. **47**:666-699 (Oct.) 1957.
4. Kinney, J. R.: Prevalence of Antibiotically Treated People, Ann. Int. Med. **47**:71-77 (July) 1957.
5. Dearing, W. H.: Micrococcic Enteritis and Pseudomembranous Enterocolitis as Complications of Antibiotic Therapy, Ann. New York Acad. Sc. **65**:235-241 (Aug. 31) 1956.
6. Miller, P. B., and Sandweiss, D. J.: Perforation of Postgastrectomy Stomach Ulcer During Cortisone Therapy, Gastroenterology **31**:399-403 (Oct.) 1956.
7. Woffard, J. D., and Cummins, A. J.: Hemorrhage from Duodenal Ulcer During Administration of Reserpine, New England J. Med. **255**:1193-1194 (Dec. 20) 1956. Gray, S. J.; Ramsey, C.; Reifenstein, R. W.; and Benson, J. A., Jr.: Significance of Hormonal Factors in Pathogenesis of Peptic Ulcer, Gastroenterology **25**:156-172 (Oct.) 1953.
8. Schneider, E. M., and Clark, M. L.: Gastric Secretion as Influenced by Rauwolfia Alkaloids, Ann. Int. Med. **47**:640-650 (Oct.) 1957. Reference 3.
9. Neefe, J. R.; Gellis, S. S.; and Stokes, J., Jr.: Homologous Serum Hepatitis and Infectious (Epidemic) Hepatitis: Studies in Volunteers Bearing on Immunological and Other Characteristics of Etiological Agents, Am. J. Med. **1**:3-22 (July) 1946.
10. Kligman, A. M.: Are Fungus Infections Increasing as Result of Antibiotic Therapy? J. A. M. A. **149**:979-983 (July 12) 1952.
11. Sarewitz, A. B.: Treatment of Genitourinary Moniliasis with Orally Administered Nystatin, Ann. Int. Med. **42**:1187-1189 (June) 1955.
12. Finger, D., and Wood, W. B., Jr.: Apparent Activation of Salmonella Enteritis by Oxytetracycline, Am. J. Med. **18**:839-841 (May) 1955.
13. Kirsner, J. B., and Ford, H.: Effect of Reserpine upon Basal Gastric Secretion in Man, A. M. A. Arch. Int. Med. **99**:390-400 (March) 1957. References 3 and 8.
14. Ruffin, J. M.; Texter, E. C., Jr.; Carter, D. D.; and Baylin, G. J.: Role of Anticholinergic Drugs in Treatment of Peptic Ulcer, J. A. M. A. **153**:1159-1161 (Nov. 28) 1953.
15. Kramer, P.: Adverse Effects of Belladonna Alkaloids in Benign Pyloric Obstruction: Experimental Study, New England J. Med. **251**:600-605 (Oct. 7) 1954.
16. Koskinen, P.: Pancytopenia During Salazopyrin Treatment: Case Report, Ann. chir. et gynaec. Fenniae (supp. 5) **43**:180-183, 1954.
17. Bartholomew, L. G., and Cain, J. C.: Abdominal Pain Following Use of Chlorpromazine, J. A. M. A. **163**:733-734 (March 2) 1957.

ESOPHAGEAL CYTOLOGY BY A GAUZE-SPONGE SMEAR TECHNIQUE

Lee M. Hershenson, M.D., Virginia Lerch, M.A.
and
Morris A. Hershenson, M.D., Pittsburgh

For cytological examination of the esophagus, a small piece of gauze is rubbed past a suspected lesion by means of an esophageal dilator introduced over a rubber-tipped guide wire. Smears made from the material thus obtained contain large numbers of well-preserved cells. This facilitates accurate differentiation of benign from malignant lesions, since the probability of finding tumor cells in a case of cancer depends on the total number of cells sampled and correct identification requires cells in a well-preserved state. Except where esophageal varices are suspected, this method appears to be safe. No complications were encountered, and diagnostic accuracy was high.

Cytological methods of examination have well-established value in the confirmation of clinically or radiologically suspected malignancy of the esophagus. They are safer and more convenient than biopsy through the esophagoscope and have in some instances even a greater accuracy. Not always, however, is adequate cellular material obtained by the usual lavage procedure. A technique that is consistently productive of more well-preserved mucosal cells should increase the reliability of this important diagnostic tool.

Earliest attempts at cytological diagnosis of esophageal lesions were made with smears of secretions aspirated at esophagoscopy, but frequently these gave only scanty or degenerated cells. The technique now most widely used consists of introducing a Levin tube through the nose or mouth until the tip just passes the esophagogastric junction or encounters an obstruction, then having the patient swallow several hundred milliliters of saline solution while aspirating at the same time from the tube, and making smears from the centrifuged sediment of the wash solution thus recovered. With this method several investigators[1] have reported near-

---

From the departments of medicine and pathology, the University of Pittsburgh School of Medicine and the Presbyterian and Woman's hospitals.

perfect accuracy in small groups of cases, and in another study[2] 50 of 53 cases of esophageal cancer were correctly diagnosed. In the largest series of patients examined by this method, a positive diagnosis of malignancy was made in 103 of 148 cases (69.6%) of primary esophageal neoplasms.[3] These latter authors emphasized that in most cases the malignant cells were few, to be found only after laborious screening of the slides, and that the absence or extreme scarcity of tumor cells was the usual cause of incorrect negative interpretations. They found, on the other hand, three false-positive diagnoses in 135 benign cases.

Several methods for improving the quality of the cytological material have been proposed. Smears have been made from secretions wiped off esophageal bougies after their use for therapeutic dilatation and from bits of gauze tied around the end of a Levin tube and passed down the entire length of the esophagus or to the point of obstruction.[4] A foam-rubber swab attached to a wire handle has been devised and found to give much better material than the lavage technique.[5] Good results have been reported with smears made from cotton or gauze swabs rubbed over a lesion under direct observation through the esophagoscope.[6] That procedure sacrifices convenience, but the specimens obtained are said to contain abundant cellular elements, frequently well-preserved sheets or masses of cells with histological detail intact.

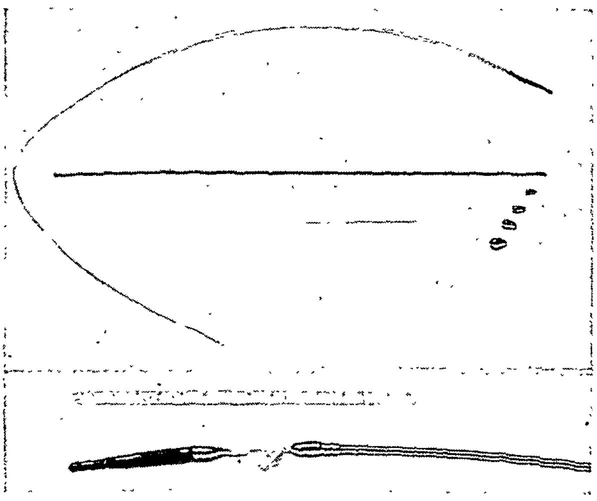


Fig. 1.—*Top,* esophageal bougie used for cytology, consisting of rubber-tipped wire guide, flexible spiral, and olive dilators. *Bottom,* detail showing rubber tip, gauze square threaded on wire, and olive attached to spiral.

Method

The method used in our present study combines the effectiveness of the gauze swab in obtaining cellular material with the convenience of a bedside or office procedure. An esophageal bougie of original design is used to push a small piece of gauze through the length of the esophagus, even past a stenotic lesion. The instrument (fig. 1) consists of two parts: (1) a stainless steel piano-wire guide, 110 cm. long, with a flexible woven-rubber tip, 6 cm. long and 3 mm. in diameter, fixed at one end and (2) a steel spiral, 65 cm. long and 2 mm. in diameter, which slides over the piano-wire guide and has at one end a rounded collar 3 mm. in diameter and at the other end a thread onto which can be screwed olive dilators ranging in diameter from 6 to 12 mm. (19 to 37 F.). The procedure for obtaining cytological specimens is carried out with the patient sitting up and with no preparation other than overnight fasting. This is necessary so that the esophagus, if partially obstructed, does not contain food residue that would make the specimen unsatisfactory. First, the guide wire is introduced by leading its flexible rubber tip into the hypopharynx with the index finger. This guide is then gently advanced until its tip is in the stomach, at which point slight resistance is easily felt. If an obstructing lesion i encountered in the esophagus, the wire is ease lightly back and forth and at the same time rotate until its soft tip finds the lumen in the esophagu and slides past the lesion without forcing. With the guide in place, a piece of fine-mesh gauze approximately 1.5 cm. square is placed on the wire, followed by the spiral with a 6 mm. (19 F.) olive attached, and this is pushed down the full length o the esophagus, carrying the gauze before it, until i meets the tip of the wire in the stomach, and the the entire assembly is withdrawn as a unit. Th whole procedure takes less than a minute. The ti of the guide wire and the olive are then separate slightly (fig. 1, *bottom*), and from the gauze between them smears are made, carefully transferrin as much material as possible to slides and immediately fixing them by immersion in alcohol-ethe mixture. The procedure then is carried out a secon time.

It is important to note that if the passage of th olive dilator is hindered by a partially obstructin lesion, it is quite safe to exert a moderate amoun of pressure in an effort to force the gauze past th lesion, since the previously inserted guide wire obviates the danger of perforation. If the smalles olive cannot pass a stenotic area, then the repea procedure is carried out with the spiral reverse using the small rounded collar at its other end t push the gauze down the esophagus. On the othe hand, if no resistance is met the first time, then th second time a slightly larger gauze square and larger diameter olive are employed. The objectiv in any case is to have the gauze rub the involve esophageal mucosa, gently abrading from any lesion enough cells to give the cytologist unequivoca evidence.

In this study the slides were stained by a mod fied hematoxylin-eosin method devised by one o us (V. L.). The simplicity and rapidity of this staining procedure are advantageous for any cytologica study. After the smears have been in the alcoho ether fixative for a minimum of five minutes, the are removed, air-dried, and immersed in Harris hematoxylin for one minute. Then they are washe briefly in tap water, dipped two or three times in very dilute (approximately 1.0%) hydrochloric acid solution, and washed again in tap water. Next, the slides are placed for 10 to 12 seconds in dilute (0.5%) eosin solution, then dehydrated in two changes of 95% alcohol and two changes of absolute alcohol, cleared in xylene and mounted with Permount. The entire staining procedure can be accomplished easily in less than 10 minutes.

The cytological criteria in preparations stained by this technique are essentially similar to those with the Papanicolaou stain.[1] Size, shape, staining, and arrangement of the cells are important in determining whether they are benign, malignant, or atypical. Most significant of all is nuclear detail. Regardless of size, shape, or staining of cells, the presence of irregular nuclear borders, dense chromatin, and prominent nucleoli is more diagnostic of tumor cells than a combination of the previously mentioned factors. No single characteristic, such as unusual size or hyperchromaticity, is worthy evidence of a malignancy. The diagnosis should be based on the occurrence of several abnormal characteristics, found not just in one cell but in many cells.

An important difference between the method for obtaining cellular material described here and the lavage method is that we often obtain tiny bits of tissue, up to 1 mm. in size and grossly visible. Although it would be feasible to fix, imbed, and section these tissue fragments by standard histological practice, it has been more convenient to make "imprint" or "touch" preparations, as performed with comparable material in bone marrow aspirates. This is done by lightly touching the tissue fragment repeatedly between a pair of slides, thus leaving on each slide "prints" of a layer of cells. Such material presents masses of perfectly preserved cells that permit unequivocal differentiation of benign and malignant tissue (fig. 2).

Results of Esophageal Cytology

	Cases, No.	Cytological Interpretation		
		Negative (No Tumor Cells)	Doubtful	Positive (Tumor Cells Present)
Benign esophageal diseases	23	23	0	0
Carcinoma, epidermoid, of esophagus	13	0	0	13
Adenocarcinoma, involving esophagus, primary in stomach	8	3	2	3
Technical failure	5	...	...	...

Results

The results that we obtained by our technique in 44 cases are shown in the table. The group of benign diseases comprised nine cases of cardiospasm (achalasia), eight of esophagitis, four of stricture, and two cases of diffuse esophagospasm. The diagnosis was confirmed in 2 of these 23 cases at operation. In the others, the impression of benignity was supported by all other clinical evidence and by subsequent progressive improvement during a follow-up period of 6 months minimum and 14 months average for the whole group. The 21 cases of carcinoma were proved by biopsy, surgery, or autopsy. The squamous cell tumors were primary in the esophagus, while the group of adenocarcinomas were growths involving both the lower end of the esophagus and the cardia of the stomach, which presumably was the site of their origin. An additional group listed in the table, the technical failures, consisted of patients having such a high degree of obstruction that the 3-mm. (10 F.) rubber tip of the piano-wire guide could not be passed through the area of obstruction, and therefore the lesion could not be wiped with the gauze. The significance of this group will be discussed later.

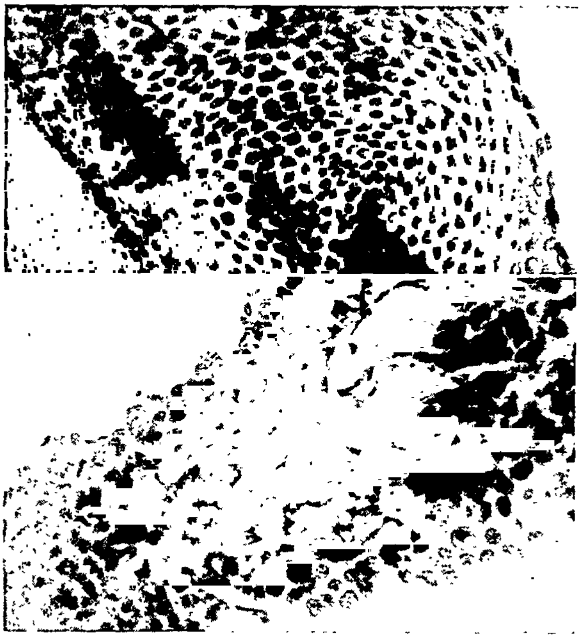


Fig. 2.—"Touch" preparations from tissue fragments obtained by gauze-sponge. *Top,* normal squamous epithelium. *Bottom,* epidermoid carcinoma.

These data indicate that a positive report of finding tumor cells by this technique was reliable, without exception in this series. There were no false-positive diagnoses in the benign cases. Neither were there any instances of failure to find malignant cells, leading to mistaken negative diagnoses, in the cases of primary epidermoid (squamous cell) carcinoma of the esophagus. It is informative also to analyze the results further according to the location of the lesion. Eleven of the benign lesions and 12 of the primary esophageal cancers were seen by x-ray to be situated above the esophagogastric junction. In the differential diagnosis of such lesions, which did not afford the possibility of being gastric in origin, the cytological method was consistently trustworthy in this series. On the other hand, the 21 patients with lesions demonstrated by roentgenographic examination to be located at the esophagogastric junction presented a problem, since a lesion of the lower end of the esophagus may be produced by extension of carcinoma of the cardiac end of the stomach. Eight such cases occurred in this series, with the gastric origin of the growth being suspected by x-ray in half of them. Esophagoscopy in six revealed no visible tumor, the esophagus apparently being involved extrinsically, with no mucosal lesion seen in the lumen. It is not surprising, therefore, that the diagnostic accuracy in these eight cases was as disappointing as with other cytological methods in carcinoma of the stomach.

Failure to accomplish properly this technique of cytological study, which occurred in five cases, gave a group in which the diagnosis by cytology was indeterminate. The significance of these technical failures must be assessed with reference to their recognition and their effect on the management of the patient. With the method described here, technical failure cannot occur without being recognized. One usually can tell when the tip of the guide wire has reached the stomach by sensing the slight resistance and observing how far the guide has been introduced, and one cannot fail to feel with certainty whether or not the olive-tipped dilator has pushed the gauze past a partially obstructing lesion. If it has not, one can anticipate that the cellular material will be inadequate. Thus, a technical failure will not be mistaken for a valid negative cytology. These failures, in our experience, are of no consequence in the management of the patient. Lesions producing such a degree of narrowing of the lumen that the tip of the guide cannot pass are lesions that, even if benign, are too far advanced to be treatable by bougienage. In such cases, nearly complete obstruction itself has proved to be an indication for resection, without regard for the differential diagnosis of the nature of the lesion.

Comment

In the 44 cases in which this technique was performed properly, interpretation of the smears was made not only with accuracy but also with ease. Cells were present in large numbers, often in sheets or clumps. There were no instances of doubtful interpretation due to inadequacy of the cellular material, the type of case that presents the most difficult problem to the cytologist. Theoretically, a diagnosis of malignancy may be based on identification of a single typical tumor cell. From the practical standpoint, few cytologists are willing to let such a grave decision rest on one cell. This is particularly true because in most cases of malignant neoplasm every exfoliated tumor cell does not exhibit all the diagnostic criteria of cancer. Diagnosis depends rather on synthesizing, from a number of cells observed, a composite picture that is characteristic of malignancy. The more cells present, the clearer this picture may be and the more reliable the interpretation. Accuracy of diagnosis depends also on obtaining cells in a well-preserved state. The method used here does this consistently, pr vided the material rubbed from the lesion by th gauze is smeared on slides as soon as the gauze i withdrawn from the esophagus and that the slid are at once immersed in fixative.

Another consideration bearing on the accuracy cytological methods that must be emphasized that they are in fact sampling processes subject t statistical laws. The probability of identifying tum cells in a case of cancer therefore depends on th total number of cells sampled. Any technique th puts more cells on the slide will inevitably gi greater diagnostic accuracy.

The evaluation of any new technique requires careful scrutiny of its possible hazards. We believe that the method presented here should not be used where esophageal varices are suspected because of the potential risk of inducing hemorrhage. Varices usually can be differentiated from carcinoma by roentgenographic examination. In the occasional case where this leaves some doubt, esophagoscopy is conclusively diagnostic. With this possible exception, the technique appears to carry no risk of hemorrhage. Although the gauze frequently was blood-stained after rubbing past a lesion, significant bleeding did not occur in any of our cases. The potential risk of perforation is eliminated by exercising gentleness and discretion in advancing the rubber-tipped guide wire. Once it is in place, it unfailingly leads the dilator through the lumen with no danger. An esophageal diverticulum, which none of the patients in this series presented, would require particular care in the introduction of the guide. We have used this guide wire and the olive-tipped bougies for therapeutic dilatation several hundred times in the past seven years without accident.

Summary and Conclusions

A new method for obtaining material from the esophagus for use in cytological examination is carried out by the pushing of a small piece of gauze past a suspected lesion by means of an esophageal dilator introduced over a rubber-tipped guide wire. Smears made from the material thus obtained contain large numbers of well-preserved cells, facilitating accurate differentiation of benign from malignant lesions.

With the use of this technique in 44 patients, correct negative diagnoses were made in all of 23 cases of benign esophageal disease, and correct positive diagnoses of malignancy were made in all of 13 cases of epidermoid (squamous cell) carcinoma. No errors were made in the differentiation of lesions located above the esophagogastric junction. Lesions situated at the esophagogastric junction may present difficulty, since this method frequently may give a negative result with a tumor at this site that is a gastric neoplasm rather than a primary esophageal carcinoma. The results suggest that this technique should give a higher percentage of correct cytological diagnoses than lavage methods and that it may permit more early detection of cancer of the esophagus.

3700 Fifth Ave. (13) (Dr. Hershenson).

References

1. *Imbriglia, J. E.; Stein, G. N.; and Lopusniak, M. S.:* Cytological Study of Upper Gastrointestinal Sediment: Its Value, as Correlated with Roentgenologic and Clinical Findings, in Diagnosis of Cancer, J. A. M. A. **147**:120-122 (Sept. 8) 1951. Klayman, M. I.: Diagnosis of Esophageal Carcinoma by Exfoliative Cytology, Including Two Cases of Cardiospasm Associated with Carcinoma of Esophagus, Ann. Int. Med. **43**:33-44 (July) 1955.

2. Raskin, H. F., and others: Gastrointestinal Cancer: Definitive Diagnosis by Exfoliative Cytology, A. M. A. Arch. Surg. **76**:507-516 (April) 1958.

3. Johnson, W. D.; Koss, L. G.; Papanicolaou, G. N.; and Seybolt, J. F.: Cytology of Esophageal Washings: Evaluation of 364 Cases, Cancer **8**:951-957 (Sept.-Oct.) 1955.

4. Andersen, H. A., McDonald, J. R.; and Olsen, A. M.: Cytologic Diagnosis of Carcinoma of Esophagus and Cardia of Stomach, Proc. Staff Meet. Mayo Clin. **24**:245-253 (May 11) 1949.

5. Henning, N., and Witte, S.: Atlas der Gastroenterologischen Cytodiagnostik, Stuttgart, Georg Thieme, 1957.

6. Terracol, J., and Guibert, H. L.: La biopsie de l'œsophage par écouvillonage, Presse med. **58**:371-372 (April 5) 1950. Pricolo, V.; Baglioni, T.; and Amisano, G.: Citodiagnosi dei tumori dell'esofago (prelievo con tamponi di garza), Tumori **25**:401-414, 1951. Reference 4.

HAZARDS OF ANTIBIOTIC THERAPY

Wallace E. Herrell, M.D., Lexington, Ky.

The indiscriminate use of antibiotics has created serious problems. Two episodes here given illustrate the misuse of penicillin. Patients for whom it is ordered should be questioned as to evidence of sensitivity, and after an injection they should be watched by a physician or nurse for 30 minutes. Reactions, if they occur, should be treated not with oxygen but with epinephrine or with steroids intravenously. The use of streptomycin is rarely followed by major complications, but its minor side-effects include contact dermatitis, and its toxic effects on the eighth cranial nerve, though not life-endangering, are distressing. Preliminary studies indicate that dihydrodesoxystreptomycin is less toxic. The fact that the tetracyclines are highly effective and can be given by mouth has resulted in widespread misuse. They can cause blood dyscrasia and anaphylactic reactions, but the most serious major hazard is superimposed staphylococcic enterocolitis and wound infections. There is a definite association between chloramphenicol and aplastic anemia. The rational use of antibiotics in the future depends on a return to strict aseptic technique in hospitals. The occasional temporary exclusion of one or more antibiotics from the hospital, long enough for the common pathogens to regain their sensitivity to it, would greatly improve the effectiveness and increase the safety of antibiotic medication.

Some may feel that the topic of the hazards of antibiotic therapy has been overlabored. It is my conviction, however, that a discussion of this subject is more important today than it has been at any time since the introduction of antibiotics almost 20 years ago. Sir Alexander Fleming's life was largely devoted to studying microbes and their behavior. In 1918, he became interested in wound infections, and it was in 1929, while he was studying the behavior of staphylococci, that the famous contamination of his culture occurred. Fleming, if he were here today, would be vitally interested in the problems that confront those of us who are occupied with the use of antibiotic agents in the treatment of infectious diseases.

The topic I am to discuss is the hazards of antibiotic therapy. Space does not permit detailed discussion of the nearly 20 antibiotics that are clinically available. I shall comment on the reactions of toxicity that may be encountered after the administration of the most commonly used antibiotics, classifying them as minor (non-life-endangering) or major (life-endangering and fatal) hazards.

Minor hazards of antibiotic therapy are drug rash (with or without pyrexia), angioneurotic edema and urticaria, serum sickness-like reaction, intestinal reactions (including diarrhea, nausea, and flatulence), superimposed infections (such as id reactions and infections due to Candida), certain neurotoxic reactions, and renal irritation. Major hazards of antibiotic therapy are anaphylactic reactions,

---

From the Section on Medicine, Lexington Clinic.

Read in the Panel Discussion on a General Review of the Hazards Encountered in the Use of Certain Therapeutic Agents before the General Scientific Meetings at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

superimposed staphylococcic infections (including staphylococcic enterocolitis and staphylococcic septicemia), blood dyscrasia, and exfoliative dermatitis.

Penicillin

Penicillin possesses a low degree of toxicity. However, its widespread and indiscriminate use has created serious problems. The average yearly production of penicillin for human use at present is approximately 200 tons, which is equivalent to more than 2 billion average daily doses of 300,000 units each. It is not surprising, therefore, that problems have arisen.

The most commonly encountered minor reactions to penicillin include drug rash (with or without pyrexia); angioneurotic edema and urticaria; serum sickness-like reaction; and id reactions. These reactions are troublesome to be sure, but their management poses no great problem.

The major hazards of penicillin therapy today are anaphylactic reactions and superimposed staphylococcic infections. Welch and associates,[1] in a recent survey, reported a mortality of approximately 10% in 793 cases of anaphylaxis due to penicillin over a three-year period. This reaction occurs with about equal frequency in both sexes. I would like to emphasize, however, that it occurs less frequently in individuals less than 12 years of age. It is also evident that anaphylactic reactions to penicillin usually occur after the intramuscular administration of procaine penicillin G. The figure of 793 cases in a three-year period may well be conservative, since many reactions of this type are not reported. My own experience, however, agrees closely with the quoted mortality of approximately 10%. I believe that early recognition and immediate treatment of anaphylactic reactions to penicillin would lower the mortality. The following case report is a typical example of the hazard under discussion.

A 48-year-old, previously robust and healthy man was admitted to the hospital at 6 p.m., because of cough, fever, and chills of six days' duration. He had received symptomatic treatment for three days. There were physical signs of pneumonia in the left upper lung, and roentgenographic studies revealed pneumonia in that lobe. Laboratory study results were negative, except for a leukocyte count of 23,600 per cubic millimeter. There is no record that the patient was questioned concerning any previous sensitivity to penicillin. The resident ordered 1 million units of procaine penicillin G to be administered by the intramuscular route. This was done by the nurse, who then returned to her station. Twenty minutes later the patient was found dead. Postmorten examination revealed pneumonia in the left upper lobe and edema in the remaining lung tissue. No other significant cause for the patient's death was found.

This report of a case from a hospital is, I fear, an example of an anaphylactic cause of death that might have been prevented. The conspicuous deficiencies in the management of this case were that no attempt was made to elicit the history of previous sensitivity to penicillin and that the patient was left alone after injection of the antibiotic. Since experience has shown that anaphylactic reactions to penicillin occur within 30 minutes after its administration, a physician or a nurse should remain with the patient during that time.

The following report, with the headline "Penicillin Reaction Kills Woman," appeared in a leading newspaper in a metropolitan city in March, 1958:

> (Name of city).—(Name of woman), 34, 705 N. W. Second St., died Friday night in ——— Hospital as the result of a reaction to penicillin administered for contusions she suffered in a beating, Dr. ———, county medical examiner, said. A penicillin reaction severe enough to cause death is "rare," he added. Police Officer ———, called to the hospital when the woman was admitted for treatment, said the drug was given by a nurse. The nurse called Dr. ——— as soon as the reaction set in and the injured woman's breathing became difficult, according to ——— (the police officer). Dr. ——— placed the woman in an oxygen tent, but she died about 20 minutes later. (The police officer) ——— said the woman told him after the reaction set in that she had been similarly affected before. He said her injuries were not serious.

I believe that several principles of antibiotic therapy were violated in this case. The antibiotic was administered for contusions, in the absence of any demonstrable infection. The history of previous sensitivity to penicillin was not elicited before its administration. Treatment was carried out without a physician in attendance. When the reaction occurred, oxygen was administered, instead of epinephrine or steroids intravenously. Finally, the newspaper report states that this type of death is rare, which, unfortunately, is untrue.

Superimposed staphylococcic enterocolitis and septicemia, major hazards of antibiotic therapy, do occur occasionally after the administration of penicillin. From my own experience and that reported by others, I would estimate their incidence is probably no greater than 1%. I therefore propose to discuss these hazards later. Likewise, blood dyscrasia is quite uncommon after penicillin therapy. Fatal exfoliative dermatitis is a rare reaction but is a serious problem when it does occur. It is a major threat in an individual who is sensitive to penicillin and who receives long-acting penicillin, such as benzathine preparations. For this reason, I rarely use such preparations.

Streptomycin and Dihydrodesoxystreptomycin

Streptomycin.—Several minor hazards may be encountered after the administration of streptomycin. Drug rash, although not common, sometimes occurs. Perhaps the most troublesome cutaneous toxic reaction to streptomycin is contact dermatitis. The most serious minor hazard of streptomycin therapy is toxicity for the eighth nerve. It is well known that disturbance of the vestibular branch of the eighth nerve occurs more often when the streptomycin base is used, while impairment of the auditory branch of the nerve is a more common occurrence after the administration of dihydrostreptomycin. Circumoral paresthesia is a not uncommon reaction to either form of streptomycin. It should be emphasized that, although neurotoxic reactions may be distressing to the individual who experiences them, they are, for the purpose of this discussion, classified as minor (non-life-endangering) hazards.

Major hazards, such as anaphylactic reactions, superimposed staphylococcic infections, and blood dyscrasia, rarely have occurred after the administration of streptomycin.

Dihydrodesoxystreptomycin.—Dihydrodesoxystreptomycin sulfate is a chemical analog of streptomycin developed by Ikeda and associates[2] at the Scientific Research Institute in Tokyo. Their studies suggested that this preparation was as active as, or slightly more active than, the parent compound and was less toxic. For the past six months my colleagues and I have carried out some clinical studies on this antibiotic. To date we have used it in the treatment of 51 patients. Twenty-six of these patients were suffering with a variety of severe, acute infections. The average daily dose of dihydrodesoxystreptomycin was 1 to 2 Gm., given in divided doses every 12 hours by the intramuscular route. We have administered as much as 2 Gm. of the antibiotic daily for 14 days. If continued longer, the dosage was reduced to 1 Gm. daily. We have successfully administered dihydrodesoxystreptomycin by the intrathecal route, also. The recommended dose is 100 mg. per injection. Twenty-five patients with culturally proved pulmonary tuberculosis also have been treated with dihydrodesoxystreptomycin. This study was carried out in collaboration with Dr. James T. Gilboy at the Julius Marks Sanatorium in Lexington, Ky. In the treatment of tuberculosis, the antibiotic was administered in doses of 1 Gm. twice weekly. Our studies to date, although preliminary, permit us to make the following statement: When compared with other forms of streptomycin, dihydrodesoxystreptomycin causes less pain at the site of injection, a lower incidence of paresthesias of the face and mouth, and less neurotoxic reactions. For example, transient impairment of hearing has been reported in only one case and dizziness or evidence of vestibular disturbance in none. These studies will be reported in detail elsewhere. If further experience confirms that to date, use of streptomycin in this form may greatly reduce the minor hazards encountered after administration of this antibiotic.

Tetracyclines

The tetracyclines are highly useful antibiotics. It is my conviction, however, that their use is attended by some of the major hazards of antibiotic therapy. The fact that these antibiotics can be administered effectively by the oral route has resulted in their widespread and indiscriminate use. Minor hazards that may follow administration of the tetracyclines include drug rash (which is not common), urticaria, and mild gastrointestinal disturbances. Superimposed infections due to Candida, which are of a local character, constitute another frequently encountered problem.

Major hazards, such as blood dyscrasia, exfoliative dermatitis, and anaphylactic reactions, rarely occur after the administration of the tetracycline antibiotics. Superimposed staphylococcic infection is, in my opinion, the most serious major hazard of antibiotic therapy in hospitals today. There is strong evidence to support the statement that the widespread and indiscriminate use of the tetracyclines is the chief factor involved. The two most serious superimposed staphylococcic infections are staphylococcic enterocolitis and severe wound infections with sepsis.

Staphylococcic Enterocolitis.—Staphylococcic enterocolitis is an important problem. I would like to draw attention again to the mortality of one of the major hazards of antibiotic therapy, namely, anaphylactic reactions to penicillin, which is approximately 10%. Available published material and my own experience lead me to conclude that the mortality of staphylococcic enterocolitis is in the order of 40%. This high rate undoubtedly is due to two factors: lack of recognition of the disease and inadequate treatment. The following case is an example.

The patient, a 37-year-old woman, previously had been in excellent health. Thirty-six hours before her admission to the hospital she experienced epigastric pain, which later shifted to the right lower quadrant of the abdomen. A diagnosis of acute appendicitis was made, and appendectomy was performed. The appendix was found to be acutely inflamed and gangrenous. There was a slight amount of peritoneal soiling. The patient received 400,000 units of penicillin and 0.5 Gm. of streptomycin postoperatively and again 12 hours later. On the second postoperative day, because of slight fever (101 F [38.3 C]), oral administration of tetracycline (Achromycin) was begun in a dosage of 250 mg. four times daily. On the third postoperative day her temperature was 103 F (39.4 C) and pulse rate 110 beats per minute. The tetracycline therapy was continued. There was considerable abdominal distention, and peritonitis was suspected. On the fourth postoperative day the possibility of staphylococcic infection was first considered, and swabs from the rectal secretions were made. Gram's stains revealed many clusters of a gram-positive cocci, which later, on culture, was identified as coagulase-positive Staphylococcus (Micrococcus) pyogenes var. aureus. On the fifth postoperative day tetracycline therapy was discontinued and the surgical resident ordered erythromycin administered by the intravenous route. Shortly thereafter, the patient, whose temperature had risen to 105 F (40.5 C), died. Autopsy revealed extensive staphylococcic enteritis, limited to the small intestine.

The significant points illustrated by this case are as follows: 1. It is doubtful that prophylactic use of the antibiotic was indicated. 2. The clinical picture of distention and shock was interpreted as possible peritonitis rather than ileitis. 3. Diarrhea was absent, as is often the case when the disease is limited to the ileum. 4. The patient's clinical course prompted the clinician to continue the administration of the broad-spectrum antibiotic by the oral route. 5. When, late in the course of the illness, erythromycin therapy was begun, the antibiotic was administered by the intravenous route, although it would have been far more effective had it been given through the nasal catheter and every effort made to get it directly into the intestinal tract.

Severely Infected Wounds with Sepsis.—I believe that the widespread, indiscriminate use of broad-spectrum antibiotics eliminates sensitive strains of micrococci from patients soon after their admission to hospital wards, leaving them vulnerable to attack by the resistant micro-organisms they encounter if they remain more than a few days in the hospital. This accounts for the marked increase in the wound infection rate, which results in increased morbidity and, often, serious complications, including staphylococcic septicemia.

Chloramphenicol

The minor hazards of antibiotic therapy are relatively insignificant in connection with chloramphenicol. Likewise, some of the major hazards—namely, anaphylactic reactions, exfoliative dermatitis, and superimposed staphylococcic infections—rarely occur after the administration of chloramphenicol. There can be no mistake, however, concerning the possibility of serious and fatal blood dyscrasia after the use of this antibiotic, alone or in combination with other antibiotics. The blood dyscrasia may take the form of aplastic anemia, agranulocytopenia, or thrombocytopenic purpura. By far the most common is aplastic anemia, which, unfortunately, is almost always fatal. The chance of successful treatment of blood dyscrasia is far less than that of anaphylactic reaction (10% mortality) and superimposed staphylococcic enterocolitis (40% mortality). Individuals in the younger age groups are particularly susceptible to blood dyscrasia after the administration of chloramphenicol, in contrast to the low incidence of anaphylactic reactions to penicillin in that age group. Almost 50% of cases of aplastic anemia to date have occurred in the younger age group, predominantly in white females. The following report of a case is a fairly typical example of the major hazard under discussion.

The patient, a 7-year-old girl, was admitted to the medical service of a hospital on Dec. 6, 1957. She had had measles and chicken pox. For two years she had had frequent respiratory infections and mild asthma. On Nov. 1, 1957, she had been hospitalized because of bronchopneumonia and treated with a suspension of chloramphenicol for 11 days with good response. On Dec. 2, characteristic lesions of purpura were noted on the child's ankles and she was found to be very anemic. She received 500 cc. of blood. On admission to the hematology service, her erythrocyte count was 3,500,000 per cubic millimeter, hemoglobin concentration 11.1 Gm. per 100 cc., platelet count 25,000, and leukocyte count 2,100 per cubic millimeter. The differential count was as follows: neutrophils 8%, lymphocytes 89%, monocytes 1%, and eosinophils 2%. Bone marrow aspiration revealed only a few normal elements; most of the cells identified were plasma cells and mature lymphocytes. Findings in the remainder of the laboratory and roentgenographic studies were negative. The patient was dismissed three days later. On Dec. 25, she was readmitted because of epistaxis and a perirectal infection. Her temperature became extremely high and spiking, and there was bleeding from her gums. Blood cultures were positive for Escherichia coli. The patient died on Jan. 2, 1958. Autopsy findings confirmed the clinical diagnosis of aplastic anemia.

I have pointed out repeatedly in the past the definite association between the administration of chloramphenicol and the development of aplastic anemia. It seems to me the problem is clear-cut. Chloramphenicol is the drug of choice in the treatment of typhoid and salmonellosis. It is also effective against some infections due to strains of Staph. pyogenes var. aureus that are resistant to other antibiotics. Therein lies its usefulness. There seems little justification for using chloramphenicol in preference to other available agents in the treatment of pneumococcic and streptococcic infections, particularly in the younger age group.

Erythromycin

Erythromycin is an antibiotic that has been widely used. Minor hazards that have been encountered after its administration are drug rash (rare) and, on occasion, flatulence and diarrhea (which usually occur when the dosage of erythromycin exceeds 300 mg. every six hours). Erythromycin is by far the least toxic of the commonly used antibiotics. I am unaware of any major or life-endangering hazard that has resulted from its use.

Miscellaneous Antibiotics

Neomycin.—Toxic effects on the eighth cranial nerve and renal irritation are the two most troublesome reactions that may occur after the administration of neomycin.

Bacitracin.—Impairment of renal function may result when bacitracin is administered in doses in excess of 10,000 units four times daily.

Polymyxin.—Severe pain at the site of injection and neurotoxic effects, such as paresthesias and cerebellar ataxia, are common reactions to polymyxin.

Novobiocin.—There is a high incidence of cutaneous toxic reactions, with or without fever, after administration of novobiocin. In my experience, the incidence of this reaction is in the order of 20%.

Vancomycin.—Vancomycin, a new antibiotic, is active against strains of Staph. pyogenes var. aureus that are resistant to many other antibiotics. Impairment of function of the eighth nerve after its administration has been reported. This toxic effect is greatly increased if vancomycin is administered in the presence of impaired renal function. Hyperpyrexia, drug rash, and severe phlebitis at the site of injection also have been reported to follow vancomycin therapy.

Amphotericin B.—This antibiotic shows promise in the treatment of certain systemic mycoses. In my experience with it, which is limited, there appears to be a wide variation in different persons' ability to tolerate this drug. Chills and hyperpyrexia are the most troublesome reactions when the dose of amphotericin B is in excess of the patient's tolerance. Transient azotemia also has been observed after administration of this antibiotic.

Ristocetin.—Definite but transient leukopenia has been reported after ristocetin therapy.

Comment

It is my opinion that the three major hazards of antibiotic therapy are anaphylactic reactions, superimposed staphylococcic infections, and blood dyscrasia. Although many of the antibiotics have been incriminated in all of these hazards, the evidence suggests that serious and often fatal anaphylactic reactions are most common after the administration of procaine penicillin G by the intramuscular route; serious and often fatal superimposed staphylococcic infections, largely a problem in hospitalized patients, are due at least in part to the widespread use of the broad-spectrum antibiotics; and serious and often fatal blood dyscrasia occurs most frequently after the administration of chloramphenicol. A discussion of the hazards of antibiotic therapy would fail in its purpose if recommendations were not made for curtailing and controlling them. Therefore, the following recommendations are made.

Anaphylactic Reaction.—Discourage and discontinue the indiscriminate use of penicillin. Never administer procaine penicillin G by the intramuscular route to patients with a history of previous sensitivity to this antibiotic or repeated allergic manifestations, including asthma. Keep any patient to whom procaine penicillin G is administered intramuscularly under observation for at least 30 minutes after the injection. When an anaphylactic reaction occurs, immediately administer epinephrine hypodermically or steroids intravenously or, in some instances, both.

Superimposed Staphylococcic Infections.—Abolish the routine prophylactic use of all antibiotics in patients with uninfected surgical wounds of all types. Insist on a return to strict aseptic technique in the surgical suites and in the dressing of all wounds. Immediately obtain a culture of all wounds suspected of being infected and study the microorganisms, especially Staph. pyogenes var. aureus, by means of sensitivity tests and bacteriophage typing. Isolate every patient in the hospital with a staphylococcic infection. If necessary, reopen the isolation wards formerly inhabited by patients suffering with common contagious diseases. Make cultures periodically of the nasopharynx of personnel in hospitals, particularly those in so-called key areas. Treat or remove these individuals when they are found to harbor antibiotic-resistant microorganisms. Do not hesitate to manipulate the antibiotics. For example, exclude from use in the hospital one or more of the antibiotics for a long period of time and then readmit them if the common pathogens regain their sensitivity. Return to a well-documented method of preventing surgical complications in certain abdominal procedures, namely, the installation of 5 Gm. of sulfathiazole in the peritoneum at the time of abdominal surgery when there is evidence of soiling of the peritoneum.

Blood Dyscrasia.—We must accept the available evidence that strongly suggests the connection between the use of chloramphenicol and the development of blood dyscrasia. Restrict use of this antibiotic to the treatment of typhoid, salmonellosis, and the occasional infection caused by Staph. pyogenes var. aureus that is resistant to other available antibiotics. Condemn the use of chloramphenicol in the treatment of mild, non-life-endangering infections of all kinds. Do not administer this antibiotic to patients in the younger age group (under 12 years of age), with the possible exception of those suffering with typhoid or salmonellosis.

1221 S. Broadway.

References

1. Welch, H.; Lewis, C. N.; Weinstein, H. I.; and Boeckman, B. B.: Severe Reactions to Antibiotics: Nationwide Survey, in Antibiotics Annual, 1957-1958, edited by H. Welch and F. Marti-Ibañez, New York, Medical Encyclopedia, Inc., 1958, pp. 296-309.
2. Ikeda, H., and others: Dihydrodesoxystreptomycin, New Reduction Product of Streptomycin: I. Preparation and Characterization, Proc. Japan Acad. **32**:48-52, 1956.

DIETARY APPROACH TO ATHEROSCLEROSIS.—Atherosclerosis is the Number One public health problem. Many factors have been implicated in the pathogenesis of this disease. Prominent among these factors is the amount and kind of fat in the diet. The evidence now appears to be conclusive that sufficient quantities of polyunsaturated fat in the diet, with proportional decrease in saturated fat, will result in major decrease in blood lipid. Some evidence indicates that such blood lipid lowering produces a desirable effect upon existing atherosclerosis. Much additional time and work will be required to clarify the prophylactic and therapeutic value of this type of dietary approach.—Harry Balch, M.D., Stanford Splitter, M.D., Paul Flynn, M.D., and L. W. Kinsell, M.D., The Relationship of Dietary Fat to Atherosclerotic Disease, *California Medicine,* September, 1958.

TREATMENT OF POLYCYTHEMIA VERA WITH BUSULFAN (MYLERAN)

John Louis, M.D., Chicago

Polycythemia vera was treated in 18 patients in whom the disease had existed for periods ranging from two months to 10 years. Most of the patients had been treated previously by various means, and three were in a state of partial remission (having normal hematocrit readings) at the time of the study. All were treated with busulfan (Myleran) by mouth. Initial dosages ranged from 2 to 10 mg. daily; maintenance dosages ranged from 8 mg. per day to 2 mg. per week. In seven patients this treatment was supplemented with venesection. Complete remission (normal hemograms with absence of signs and symptoms of polycythemia vera) was obtained in 11 patients; incomplete remission (normal hemograms with persistence of one or more signs or symptoms of the disease) was obtained in 6; partial remission occurred in one case. Hematocrit values, which ran as high as 70 in some male patients, returned in every case to normal levels (less than 54% for men). Leukocyte counts were lowered in every case and fell to leukopenic levels (less than 3,500 cells per cubic millimeter) in three. Two patients, whose case histories are given, developed anemia and thrombocytopenia in addition to leukopenia. Close supervision of the patients receiving busulfan therapy is necessary if excessive depression of the bone marrow is to be avoided. The ultimate place of this drug in the treatment of polycythemia vera remains to be determined.

Busulfan (Myleran) has been an effective agent for the treatment of chronic granulocytic leukemia; however, it has been reported to be of little therapeutic value in other myeloproliferative diseases. Currently there are three methods for the treatment of polycythemia vera; they include the use of venesection, radioactive phosphorus (P^{32}), and triethylene melamine. Each method has a disadvantage. Venesection, though it decreases the red blood cell mass, has little effect on the leukocytes and thrombocytes, so that many of the complications associated with increase in these elements continue to be manifested. Repeated venesection, in addition, leads to an unphysiological state of iron deficiency. Therapy with radioactive phosphorus produces a more nearly normal state, since all of the marrow elements are suppressed. However, certain hematologists are of the opinion that this form of therapy is associated with a greater incidence of leukemia. Though this objection has not been conclusively documented, the possibility of such side-effects has tempered enthusiasm for the use of this agent in the treatment of polycythemia vera.

These objections to current methods of therapy made it desirable to investigate the relative merits of other marrow-suppressing agents. During the past eight years we have evaluated such agents. At the suggestion of Dr. J. H. Burchenal we studied the effect of busulfan in the control of the polycythemic state.[1] The present report deals with one and one-half years experience in the treatment of polycythemia vera with busulfan.

Methods and Results

Eighteen patients with polycythemia vera were treated with busulfan for 4 to 76 weeks (mean 38 weeks). There were 8 women and 10 men, with ages ranging from 50 to 71 years (mean 62.8 years). The diagnosis of polycythemia vera was established by the usual hematological techniques. The known duration of illness ranged from two months to 10 years. All except three patients had received prior therapy. Seven patients had been previously treated with combinations of radioactive phosphorus, triethylene melamine, and venesection. Eight patients had received intermittent courses of therapy with triethylene melamine and venesection.

Hematocrit readings at the onset of therapy ranged from 47 to 70% in the men and from 50 to 55% in the women. Three of the men were not polycythemic at the onset of therapy and were, therefore, given maintenance doses of busulfan. The initial dose of busulfan varied from 2 to 10 mg. per day for intervals of 1 to 12 weeks. The mean dose per day of the initial treatment period ranged from 2 to 4 mg. per day (mean 3.0 mg.; median 3.0 mg.; 95% limits 1.5 to 6.5 mg.). The median of the initial treatment period, from the beginning of therapy with busulfan to the onset of remission, ranged from 1 to 57 weeks (mean 19 weeks; median 10.2 weeks; 95% limits 1 to 80.6 weeks). This therapy lowered hematocrit values to normal (males < 54%, females < 48%) in all of the patients treated and represented reductions of 2 to 19% (mean 7.2%). In seven of the patients venesection was done in conjunction with busulfan therapy: two, 500 ml.; one, 1,000 ml.; three, 1,500 ml.; and one,

---

From the Department of Medicine, University of Illinois.

5,000 ml. An obvious correlation between the dosage of busulfan and the degree of hematocrit reduction was not apparent.

Leukocyte counts were lowered in each instance. Nine patients had leukocyte counts greater than 12,500 cells per cubic millimeter (range 16,000 to 54,000). In these patients the leukocyte count became normal in all except two, after 1 to 50 weeks of therapy (mean 16.3 weeks). Two patients whose counts were still elevated at the time of this analysis had counts of 13,000 and 19,000 cells per cubic millimeter after 3 to 21 weeks of therapy. Reduction in the leukocyte count either preceded, concurred with, or, most frequently, followed the decrease in the hematocrit readings. The changes in the leukocyte count, therefore, did not necessarily parallel reductions in the hematocrit readings.

For the purpose of analysis in this report, a complete remission refers to attainment of a state with a normal hemogram and the absence of signs and symptoms referable to polycythemia vera. An incomplete remission is attainment of a state with a normal hemogram but with persistent abnormalities in the signs and/or symptoms. Partial remission is attainment of a state with normal hematocrit reading but with abnormalities in the other formed elements in the blood. No response is failure of any change to occur.

The hematocrit readings were normalized in all of the patients treated. Eleven patients attained complete remission, six incomplete remission, and one a partial remission. Two patients reverted to their polycythemic state after complete remissions of 22 and 48 weeks. Both have responded to second courses of therapy. The remaining patients are in their initial remission, ranging from 4 to 58.7 weeks (median 17 weeks). All but two patients received maintenance therapy. The maintenance dose ranged from 2 to 18 mg. per week (mean 9.5 mg.) for intervals of 4 to 58.7 weeks (mean 24.6 weeks). The size of the maintenance dose was governed by changes in the peripheral hemogram. During the initial period of therapy patients were observed at weekly intervals until a remission was obtained. Subsequent to correction of the polycythemic state and stabilization of the hemogram, patients were observed at monthly intervals.

Spleens were palpably enlarged before the administration of busulfan in six patients. During remission the spleen could not be palpated in one; the size was decreased in four, unchanged in one, and enlarged in another patient whose spleen was not palpable prior to therapy. The liver was palpably enlarged in four patients prior to therapy with busulfan. During remission the liver appeared larger in two, was no longer palpable in the other, and was not altered in size in the fourth patient. Leukopenia (leukocyte counts $<$ 3,500 cells per cubic millimeter) occurred in three patients. In one the leukocyte count decreased to 3,100 cells per cubic millimeter but subsequently became normal after therapy was discontinued for one month.

Report of Cases

Two patients developed anemia and thrombocytopenia in addition to leukopenia.

Case 1.—A 55-year-old male had had polycythemia vera for three years prior to receiving busulfan. He had been previously treated with triethylene melamine and venesection. His last dose of triethylene melamine had been given four months prior to busulfan therapy. Maintenance therapy was instituted consisting of 2 mg. per day of busulfan for seven weeks. With the patient on this dosage the hematocrit reading rose from 48 to 56 mm. The dosage was then increased to 4 mg. per day for 16 weeks, with resulting decrease in the hematocrit reading to 54% and the leukocyte count to 6,600 cells per cubic millimeter. The dosage of busulfan was then reduced to 2 mg. per day for six weeks. Therapy was then discontinued because of a reduction in the leukocyte count to 2,800 cells per cubic millimeter. Subsequently the pancytopenia developed and progressed until five weeks after cessation of therapy when the leukocyte count was 1,900 cells per cubic millimeter, hematocrit reading 21%, and platelet count 19,520 cells per cubic millimeter. This state has persisted until the present time (20 weeks after cessation of therapy). The bone marrow contained normal cellularity of all the hematopoietic elements. Clinically, except for moderate weakness, the patient is asymptomatic and able to continue with his occupation.

Case 2.—Pancytopenia developed in a second patient receiving busulfan—a 55-year-old woman with polycythemia of four years' duration. Initially she received 4 mg. per day for two weeks. Her dosage was increased to 8 mg. per day for four weeks since the hematocrit reading increased from 52 to 54%. This reduced the hematocrit reading to 53%, but therapy was discontinued because of a drop in the leukocyte count from 15,300 to 4,500 cells per cubic millimeter. The ensuing pancytopenia progressed to its maximum intensity 13 weeks after therapy was stopped. At this time the hematocrit reading was 25%, leukocyte count 1,400 cells per cubic millimeter, and platelet count 30,000 cells per cubic millimeter. The patient was given a transfusion of 500 ml. of blood because of the onset of weakness, palpitation, and anginal pain. Bone marrow was adequate in cellularity for all the hematopoietic elements. The polycythemic state subsequently reappeared 48.5 weeks after cessation of therapy.

Comment

In this series of patients busulfan effectively alleviated the polycythemic state. The wide variation in dosage, however, necessitates frequent patient visits and makes the use of this agent more cumbersome than other forms of therapy. In 2 of 18 patients the development of unheralded pancytopenia further emphasizes the importance of close supervision of patients receiving this therapy. This problem further adds to the difficulty of establishing safe maintenance dosage. Venesection concomitant with busulfan therapy appeared to minimize this problem in the seven patients so treated. The delay in the manifestation of the marrow-suppressing effects from drug therapy appeared reduced by this procedure since smaller doses of busulfan were required. By this method, therapy is aimed at preventing elevation of the hematocrit reading to polycythemic levels rather than at effecting a reduction. Other side-effects from busulfan therapy have not been observed in this series to date.

Therapy with busulfan did not consistently reduce the size of the liver and spleen in polycythemia vera as in chronic granulocyte leukemia.[2] Further evaluation of this agent in the treatment of polycythemia vera will be required before its ultimate place in the therapy of this disease can be established.

Summary

Eighteen patients with polycythemia vera were treated with busulfan (Myleran). In seven of these venesection was used concomitantly. The hematocrit readings were reduced to normal in all of the 15 patients with elevated readings. Three patients maintained normal readings after receiving maintenance therapy. Initial dosage of busulfan was variable, ranging from 2 to 10 mg. per day for 1 to 12 weeks. Remissions lasted up to 65 weeks. All but two patients received maintenance therapy ranging from 8 mg. per day to 2 mg. per week. Transient leukopenia occurred in one and pancytopenia in two others. Close supervision of polycythemic patients receiving busulfan therapy is necessary to prevent excessive marrow suppression.

840 S. Wood St.

This study was supported by a research grant from the National Cancer Institute of the National Institutes of Health Public Health Service.

References

1. Louis, J.: Treatment of Polycythemia Vera with Myleran (1, 4-dimethylsulfonoxybutane): Preliminary Report abstracted, J. Lab. & Clin. Med. **50**:928-929 (Dec.) 1957

2. Louis, J.; Limarzi, L. R.; and Best, W. R.: Treatment of Chronic Granulocytic Leukemia with Myleran, A. M. A. Arch. Int. Med. **97**:299-308 (March) 1956.

CLINICAL NOTES

ALCOHOL-INDUCED PAIN IN HODGKIN'S DISEASE

William E. Braun, A.B.
and
Bruce I. Shnider, M.D., Washington, D. C.

Ethyl alcohol, when ingested by patients with certain systemic diseases, may give rise to severe pain in the organ or organs involved by the disease process. At first, alcohol-induced pain was reported only in patients with Hodgkin's disease, and as a result was considered to be specific for this condition.[1] The most definitive statement supporting this phenomenon appeared in the Annotations of the *British Medical Journal*[11] and is quoted as follows: "Enough evidence has now accumulated to show that alcohol-induced pain in Hodgkin's disease is not just another of those clinical curiosities of little importance in the practical management of patients. So far this symptom has been reported only in Hodgkin's disease; it does not seem to occur in other types of malignant lymphomata or other neoplastic conditions."

Recently, reports of similar pain in condition other than Hodgkin's disease have become mor prominent in the medical literature[2] and have cas doubt on the specificity of this phenomenon. I 1953 Alexander[2a] reported the presence of alcoho induced pain in two instances of bone disease. H personally experienced this type of pain in Brodie's abscess of his tibia and also alluded to Lieutenant Colonel Graham who "suffered fro a pyogenic infection of bone and had experienced a similar alcohol-induced pain." Joske[2d] in discussing etiological factors in pancreatitis reported two cases in whom ingestion of only small amounts of alcohol resulted in severe pancreatic pain.

Not until 1957 did more extensive reports of the nonspecificity of this type of pain appear. James and co-workers[2b] reported two patients with carcinoma who had alcohol-induced pain at the site of their lesion and who as a result were given misdiagnoses of Hodgkin's disease. The first of these two patients noticed spontaneous relief from alcohol-

---

From the Georgetown Medical Division, District of Columbia General Hospital, and the Department of Medicine, Georgetown University School of Medicine. Mr. Braun is a Student Fellow of the National Foundation for Infantile Paralysis.

induced pain despite the fact that by x-ray her mediastinal mass had enlarged. The mediastinal mass was resected, and histological sections revealed a thymic carcinoma. The second patient at autopsy showed adenocarcinoma and necrosis of the pancreas, a similar growth in the lung, and a small adenocarcinoma in one kidney. Allowing for the possibility that in the first case the thymic carcinoma was a localized precursor of Hodgkin's disease and that in the second case the pancreatic lesion represented acute pancreatitis triggered immediately by alcohol ingestion, James and co-workers conclude: "With these reservations, our experiences suggest that alcohol-induced pain is not specific to Hodgkin's disease, but that it may occur in other malignant conditions, and that it may be the first indication of their presence. Had we known this, case one (thymic carcinoma) might have been explored while the tumour was still removable."

Another study by Conn and co-workers [2c] reported alcohol-induced pain in 4 of 98 patients tested. Two of these four had Hodgkin's disease, one a fractured hip, and one acute lymphangitis and sarcoidosis. In addition, histories of alcohol-induced pain were obtained in one case of giant follicular lymphoma, one case of Hodgkin's disease, and one case of an apparently normal male physician who was thoroughly checked for any evidence of Hodgkin's disease.

When alcohol-induced pain is present, symptoms may appear immediately after the ingestion of alcohol or after a latent period of 10 to 20 minutes. It usually continues for 15 minutes to three hours. Occasionally it may last a few seconds or a few days. Very small amounts of an alcoholic beverage, even a swallow of beer or a sip of sherry, can cause this pain, which may on occasion require morphine for relief. Characteristically, it is located at the site of the lesion, primarily bony or lymphatic, and at times more than one site may be involved.

In our series of 48 cases (see table), four patients with diseases other than Hodgkin's disease experienced alcohol-induced pain indistinguishable from that experienced by two of the patients with Hodgkin's disease.

Materials and Methods

A total of 48 patients were tested for alcohol-induced pain. Of these 48 patients 9 had Hodgkin's disease, one a lymphosarcoma, 15 bone and joint lesions, 12 had a miscellaneous group of malignancies with generalized metastases, and 11 had other diseases with associated lymphadenopathy (see table).

The ethyl alcohol was administered as an oral preparation in the form of vodka. The vodka used was 100-proof and calculated to be the equivalent of a 50% ethyl alcohol solution. Each patient was given 30 cc. of vodka mixed with an equal amount of orange juice. The clinical status and symptomatology of the patient to be tested were recorded. After the oral administration of the alcohol solution, any change in the patient's condition or symptomatology was noted. When pain did occur, personal observation was continued until the pain ceased. If no change occurred within 30 minutes, resident physicians continued observing the patient.

In all instances the preparation was given to the patients without their being aware that they were receiving alcohol, and when positive results were obtained these were checked by the administration of the orange juice alone.

TABLE 1.—*Diseases Evaluated for Alcohol-Induced Pain*

Diseases	Patients Tested, No.	Positive Results, No.
Lymphomas		
Hodgkin's	9	2
Lymphosarcoma	1	0
Bone and joint lesions		
Multiple myeloma	4	0
Osteomyelitis	4	1
Traumatic fractures	5	2
Osteoarthritis	2	0
Malignancies with metastases		
Carcinoma of the breast	2	1
Carcinoma of the lung	2	0
Carcinoma of the tonsil	2	0
Carcinoma of the esophagus	1	0
Melanoma	5	0
Other diseases with lymphadenopathy		
Pulmonary tuberculosis	6	0
Sarcoidosis	4	0
Nonspecific	1	0
Total no. of cases tested		48
Total no. of positive results		6
No. of positive results in Hodgkin's disease		2
No. of positive results in other diseases		4

Results

In the nine cases of Hodgkin's disease, two positive responses were obtained. The first patient was a 29-year-old female who had extensive involvement of her mediastinal, cervical, axillary, and inguinal lymph nodes. She had noted for several years that the ingestion of a cocktail or any other alcoholic beverage would produce pain in the supraclavicular area. At the time of admission she was found to have, in addition to the lymphadenopathy described, involvement of the supraclavicular nodes and a bony defect in the upper portion of the sternum. The ingestion of alcohol would produce a severe sharp pain in the region of the bony defect and in the supraclavicular lymph nodes after a latent period of about 10 minutes. This would last for approximately 5 to 10 minutes. It could be reproduced repeatedly by the administration of alcohol. There was no radiation and it remained localized to these areas without being manifest in the cervical, axillary, or mediastinal regions.

The second case was that of a 29-year-old male who had extensive involvement with Hodgkin's disease. Ten minutes after the ingestion of alcohol, this man became aware of the gradual onset of a dull aching pain over the cervical and axillary lymph nodes. This gradually increased in intensity, lasted for a period of 15 minutes, and then gradually disappeared. Again this symptom could be reproduced by the administration of alcohol at repeated intervals.

The next two cases demonstrated a similar type of pain produced in two patients who had traumatic fractures and were admitted to the orthopedic service. The first of these was a 46-year-old female who had a traumatic fracture of the right humerus. This patient noted the gradual onset of a dull throbbing pain at the site of fracture approximately 20 minutes after the ingestion of alcohol. This would gradually increase in severity over the next 20 minutes and then diminish and disappear. The usual duration of this symptom was about 30 minutes. The second case was that of a 29-year-old male who would develop a sudden severe pain at the site of his fracture 10 minutes after the ingestion of alcohol. This was excruciating in nature, would last for 5 or 10 minutes at this intensity, and would then gradually diminish. The duration of symptoms in this instance was 20 minutes.

Another case was that of a 43-year-old female with staphylococcic osteomyelitis involving the left hip, right tibia, and fibula. She demonstrated the sudden development of a severe sharp pain in the involved areas which would last 10 to 15 minutes and abruptly disappear.

The last case was that of a 44-year-old female who had extensive metastases from a carcinoma of the breast. This patient would note a stinging or at times a burning sensation in an axillary node which was invaded by an inflammatory metastatic process. This sensation would develop about one minute after the ingestion of alcohol and was of extremely short duration. However, it would be reproduced by repeated administration of the preparation used in this study. The administration of orange juice alone failed to reproduce this symptom.

Comment

Several theories have been proposed to explain the phenomenon of alcohol-induced pain. Hoster [1a] suggests that edema of the site involved may be responsible for the pain. However, de Winter [1e] reports a patient with an osseous lesion of Hodgkin's disease in the sacrococcygeal region who had relief of pain with hot baths. Since heat increases blood flow and causes vasodilatation, it might be expected on the basis of this theory to cause pain rather than to relieve it. Bichel and Bastrup-Madsen [1d] tested seven vasodilators in patients with Hodgkin's disease and alcohol-induced pain. None of these vasodilators (including glyceryl trinitrate ointment, histamine, and nicotinic acid) could reproduce thi symptom. Release of histamine at the site of th lesion has been suggested as a possible mechanism by Burchell,[3] however, histamine failed to produce pain in the studies by Bichel and Bastrup-Madsen Gros [1f] was able to alleviate the pain with antihistamines. This tends to support Justin's [11] theory tha vasomotor changes of an allergic nature are responsible. Dawe [4] points out that in many cases of th granulomatous type of Hodgkin's disease the lesion show deposits of hyaline fibrous material aroun smaller arteries and nerves. Swelling, induced b alcohol, in this material or in the nerve itself ma produce pain. It may be possible that alcohol ca induce swelling which heat alone cannot. Conn and co-workers [2c] propose that the irritating effect of the alcohol itself may cause the pain. It is obvious that the mechanism is not clear.

Clinical studies have demonstrated that this phe*nomenon is not specific for Hodgkin's* disease. Patients with other malignancies or bone diseases may experience pain which is indistinguishable from that seen in Hodgkin's disease after the ingestion or infusion of alcohol.

At times this finding of alcohol-induced pain may be of clinical value. Reliable clinical reports have confirmed its presence in patients with Hodgkin's disease, traumatic fracture, osteomyelitis, carcinoma of the breast, thymus, and pancreas, acute pancreatitis, acute lymphangitis, and sarcoidosis and by history (without confirmatory testing) in a case of giant follicular lymphoma and in a patient with no demonstrable pathology.[2c] The basic examination of such a patient should be directed to evaluate the presence or absence of these particular diseases.

Hoster,[1a] de Winter,[1e] and Godden and co-workers [1h] have suggested that in patients with alcohol-induced pain as a result of Hodgkin's disease the relief of this symptom might be used as an indication of successful palliative therapy. In addition, the appearance of pain at a new site in such an individual after the ingestion of alcohol may indicate new areas of involvement not yet clinically evident, and the physician should be alerted to this possibility.

In spite of these clinical implications, alcohol-induced pain must be considered a nonspecific phenomenon occurring in a variety of diseases, many of which may not yet be reported.

Summary

Forty-eight cases of various types of lymphadenopathy, bony lesions, and malignancy have been studied for the presence of alcohol-induced pain. After the oral ingestion of alcohol, in two cases of Hodgkin's disease, three cases of bone disease, and one case of metastatic carcinoma, this symptom was present. This demonstrates that this phenomenon is found in other diseases and that it is indistinguishable from that seen in patients with Hodgkin's disease. It should therefore not be used as a diagnostic aid for this condition.

It does, however, have some clinical value in directing the physician to a consideration of the various diseases in which it has been reported. In patients with Hodgkin's disease, this symptom when present may be of value in focusing early attention on new areas of involvement.

3611 R St. N. W. (7) (Mr. Braun).

This study was made under the Cancer Chemotherapy Research Program, Dr. Bruce I. Shnider, Director, supported by a grant from the National Cancer Institute, National Institutes of Health, Public Health Service, Department of Health, Education, and Welfare.

References

1. (*a*) Hoster, H. A.: Hodgkin's Disease, Am. J. Roentgenol. **64**:913-918 (Dec.) 1950. (*b*) Verbeeten, B.: Hodgkin et alcool: un symptome peu connu de la maladie de Hodgkin, J. belg. radiol. **34**:494-497, 1951. (*c*) de Backer, J., and Verbeke, R.: Pain Following Ingestion of Alcohol as Manifestation of Hodgkin's Disease with Report of Case, Belg. tijdschr. geneesk. **8**:993-995 (Nov. 1) 1952. (*d*) Bichel, J., and Bastrup-Madsen, P.: Alcohol Pain in Hodgkin's Disease, Lancet **1**:764-766 (April 18) 1953. (*e*) de Winter, J. G.: Alcohol-Induced Pain in Hodgkin's Disease, Brit. M. J. **2**:604-605 (Sept. 12) 1953. (*f*) Gros, C. M.; Veillon, A.; and Waeckel, C.: Maladies de Hodgkin et réactions douloureuses a l'alcool, Strasbourg med. **4**:653-654 (Dec.) 1953. (*g*) Hall, C. A., and Olson, K. B.: Alcohol-Induced Pain in Hodgkin's Disease, New England J. Med. **253**:608-609 (Oct. 6) 1955. (*h*) Godden, J. O.; Clagett, O. T.; and Andersen, H. A.: Sensitivity to Alcohol as Symptom of Hodgkin's Disease, J. A. M. A. **160**:1274-1277 (April 14) 1956. (*i*) Justin-Besancon, L.; Lamotte-Barrillon, S.; and Debray, J.: Réflexions sur le diagnostic et le traitement de la maladie de Hodgkin: À Propos de l'étude de 110 malades, Semaine hôp. Paris, **28**:3855-3871 (Dec. 25) 1952. (*j*) Alcohol-Induced Pain in Hodgkin's Disease, Annotations, Brit. M. J. **2**:652 (Sept. 15) 1956.

2. (*a*) Alexander, D. A.: Alcohol-Induced Pain in Hodgkin's Disease, Correspondence, Brit. M. J. **2**:1376 (Dec. 19) 1953. (*b*) James, A. H.; Harley, H. R. S.; Horton, E. H.; and Storring, F. K.: Alcohol-Induced Pain due to Carcinoma, Lancet **1**:299-301 (Feb. 9) 1957. (*c*) Conn, H. O., and others: Alcohol-Induced Pain as Manifestation of Hodgkin's Disease: Investigation of Its Specificity and Frequency, A. M. A. Arch. Int. Med. **100**:241-247 (Aug.) 1957. (*d*) Joske, R. A.: Aetiological Factors in Pancreatitis Syndrome, Brit. M. J. **2**:1477-1481 (Dec. 17) 1955.

3. Burchell, H. B., cited by Godden and co-workers.[1h]

4. Dawe, C. J., cited by Godden and co-workers.[1h]

LIPIDS IN THE BLOOD.—The lipids are for the most part insoluble in water, and in the blood they do not occur in the free state but are associated with each other and with proteins as complex water-soluble molecules (lipoproteins) and as emulsion particles (chylomicrons). In the post-absorptive state (a term used to define a state when neither absorption from the gut nor mobilization from the fat depots is occurring), the lipids in the plasma—fatty acids, triglycerides, phospholipids and cholesterol and its esters—are found in one or other of the two classes of lipoprotein complexes known as the α- and β-lipoproteins. These are maintained at a more or less steady concentration by processes which occur predominantly in the liver. When absorption of a fatty meal occurs, additional lipid, almost entirely in the form of chylomicrons, enters the blood stream from the thoracic duct and causes a transient increase in the concentration of total lipid. The chylomicrons consist predominantly of triglyceride, but they also contain a small proportion of cholesterol and phospholipid, and in the blood they are apparently stabilized by a surface layer of protein (Frazer, 1949; Robinson, 1955). The form in which fat is mobilized from the depots is less well defined; it may be partly as triglyceride in lipoproteins and chylomicrons or as unesterified fatty acid. The latter occurs in the blood as a soluble complex with the plasma albumin. In general, the removal of lipids from the blood is determined by the permeability of the blood capillary membrane to the various lipid complexes or to their lipid components. However, at certain sites, cells in contact with the blood, such as reticulo-endothelial cells or possibly hepatic parenchymal cells, may be able to take up lipids directly.—J. E. French, D.M., D.Phil., B. Morris, B.V.Sc., D.Phil., and D. S. Robinson, M.A., Ph.D., Removal of Lipids from the Blood Stream, *British Medical Bulletin*, September, 1958.

COUNCIL ON FOODS AND NUTRITION

Report to the Council

This Council has authorized publication of the following report. This article is part of a nutrition education program which is assisted by the Nutrition Foundation, Inc.

PHILIP L. WHITE, Sc.D., *Secretary.*

LOW-SODIUM DIETS—PHYSIOLOGICAL ADAPTATION AND CLINICAL USEFULNESS

Thaddeus S. Danowski, M.D., Pittsburgh

Meneely[1] and others have pointed out that the practice of adding sodium chloride to our diet is largely and perhaps entirely based on an acquired taste. It has been suggested that the use of salt as a condiment began after its introduction as a preservative of meats and other perishables. In the history of man, this event appears to have coincided with the establishment of semipermanent abodes in contrast to the previous nomadic existence. The evidence in support of this view is inferential and is based largely on the fact that the word for salt does not appear in the language of any tribe prior to the establishment of settlements. On the other hand, it should be pointed out that animals seek out springs which contain this salt. In the adult animal, at least, this may be presumed to be a matter of taste.

Adjustments to Sodium Restriction

Irrespective of whether man's taste for sodium chloride meets a fundamental physiological need or is acquired, the fact remains that mammals possess an effective means of conserving sodium and chloride during periods of total deprivation of these electrolytes. Thus, the institution of a sodium-free regimen promptly evokes a marked reduction in the renal output of this ion in the urine to levels approximating zero[2] and reduces the sodium content of sweat and saliva.[3] These levels can then be employed as a measure of the efficacy of sodium restriction. This restriction even augments the already high tendency to absorb sodium from the portions of the gastrointestinal tract caudad to the stomach.[4] This conservation is mediated largely and perhaps entirely through the adrenal cortex and particularly through the most potent of the sodium-conserving steroids, aldosterone. Other adrenocortical steroids may, however, play a role. Higher centers probably participate in this regulation in view of the demonstration that some unidentified portion of the brain influences aldosterone output,[5] that, in occasional cerebral disorders, sodium wastage occurs, and that antidiuretic hormone, under certain circumstances, exerts a natriuretic and chloruretic effect.[6] This last point is controversial, however, and requires various qualifications that are too extensive for inclusion in this review.

Only a few observations concerning the effects of sodium restriction on body composition are available, and their value is compromised by the usual limitations in such measurements and by the fact that the prolonged studies have been conducted only on ill patients.[7] Under these conditions, a slight decrease in extracellular sodium and a diminution of the extracellular space and the plasma volume usually occur. Many patients on a sodium-restricted regimen, and especially those on a rice diet, lose weight. This weight loss represents a decrease in extracellular volume, a loss of body fat, and, at least in the initial phases of the use of such diets limited in protein, a loss of body protein.

Clinical Use of Sodium-Restricted Regimens

In Congestive Heart Failure.—For at least a half-century,[8] the recognition of a diminished ability to excrete ingested sodium in congestive heart failure has provided a natural basis for sodium restriction in the prevention and treatment of edema. The once lively controversy as to whether such limitations in sodium output are the result of diminished filtration or increased tubular reabsorption of sodium has quieted down with the demonstration that both factors may be operative,[9] and it is now succinctly summarized in the phrase "glomerular-tubular imbalance." The practical issue remains: When and to what degree must sodium restriction be practiced? It seems wise to institute a diet low in sodium in all cases of congestive heart failure, prophylactically if for no other reason, even though effective control of edema may be achieved by diminishing physical activity, by administering digitalis and diuretics, and by related measures that correct the fundamental defect in congestive fail-

---

From the University of Pittsburgh School of Medicine.

ure, that is, the disparity between the needs of the tissues and the ability of the heart and circulation to meet these needs. The degree of restriction can be modified in time, however, in accord with the effectiveness of the other variables in the treatment program. In some patients a diet containing 800 mg. of sodium may suffice. In others, rigid restriction to 30 or 50 mg. of sodium fails to control or correct an increasing edema.

In Cirrhosis with Ascites with or without Edema.—Similarly, in cirrhosis with ascites and peripheral edema, the degree of sodium interdiction that is necessary is determined by the effectiveness of other measures designed to improve the renal output of this ion. Thus, replenishment of circulating colloid by plasma, human serum albumin, or plasma substitutes may induce a diuresis. Relief of increased intra-abdominal pressure by abdominal paracentesis or diuretics can diminish the tendency to reaccumulate sodium excesses in some patients. In others, none of these measures proves effective unless improvement in the underlying hepatic disorder is achieved.[10]

In Renal Diseases with Edema.—Whenever weight gain, pitting edema, or hypertension are present in acute glomerulonephritis, it is wise to restrict sodium as much as possible. The need for absolute interdiction appears less clear in the milder attacks when it is remembered that patients can pass through the entire episode without recognizable symptoms or signs. However, since the dangers of unrestricted sodium intake are definite in certain patients (hypertension, convulsions, actual or simulated congestive failure, and pulmonary edema[11]), it is best to practice salt restriction in all patients, irrespective of the severity of the attack.

In subacute glomerulonephritis characterized by a nephrotic syndrome with anasarca, only a minority of the patients control their edema on sodium restriction alone, but if restriction is not practiced routinely, the degree of edema increases. In some of these patients, however, cancellation of the low serum albumin values alone may produce a diuresis.[12]

In chronic nephritis, most patients show no clinically significant ability to dispose of sodium loads.[13] In view of this fact, the question of sodium restriction as a prophylactic measure in all cases of chronic nephritis is difficult to answer categorically. Opinions vary concerning the possible adverse effects of sodium restriction upon renal function. It is true that decreases in effective renal blood flow, in glomerular filtration, and in maximum tubular function are often recorded during the low-sodium and protein-adequate regimens, but, in the experience of Page and Corcoran[14] and of others, these are usually not of clinical significance. It is our custom to advise patients with chronic renal disease who have no edema to decrease sodium intake by avoiding high-salt foods and to employ salt substitutes as condiments. In some patients with severe hypertension, more rigid sodium restriction is prescribed, in the hope that the course of the vascular component of the disease will be retarded.[14] If the renal failure is accentuated, the patient is returned to a more liberal ration of sodium. The rare, true sodium-waster should, however, be kept in mind in limiting sodium intake in any patient with renal disease. Once edema appears, salt-losing nephritis can be discarded as a possibility.

In Treatment of Hypertension.—The advent of effective antihypertensive drugs has decreased the interest in, and the use of, low-sodium regimens in the therapy of hypertension. However, in a minority of patients with blood pressure elevations, restriction of the sodium intake to 200 mg. per day or less is followed by a decrease in readings toward or to normal.[14] The program should be followed for four to six weeks before deciding that the patient will not respond.

In Toxemia of Pregnancy.—Though detailed observations on body fluid changes in normal pregnancy and in toxemia that are based on the newer techniques are just beginning to accumulate, they support the rationale of the time-honored restriction of sodium in any pregnant woman who develops hypertension, proteinuria, or edema. Irrespective of whether these clinical manifestations in a particular patient represent toxemia or some other incidental form of cardiovascular-renal disease such as glomerulonephritis, a low-sodium diet is proper therapy. General application of this view undoubtedly played a major role in decreasing the incidence of toxemia of pregnancy.

In Low-Salt Syndromes.—Some comments are in order concerning particularly troublesome forms of the low-salt syndrome, that is, the presence of congestive heart failure, cirrhosis, or renal disease in the hyponatremic edematous patient. The whole subject of low-sodium syndromes and their relation to sodium restriction has been discussed elsewhere,[15] and at this time it will suffice to point out that these patients are usually not sodium-depleted. Their total sodium stores are actually increased, and sodium administration fails to restore the concentrations of sodium in the blood to normal and ultimately only aggravates the edema. Occasionally, an element of sodium depletion may be superimposed upon this form of hyponatremia. This seeming contradiction is resolved if it is recalled that these instances of hyponatremia fall into the so-called new steady state category. Alterations in the volume, composition, and distribution of water and sodium, either as a result of the underlying disease or possibly the therapy, are perpetuated by a new setting or a relative inefficiency of the homeostatic mechanisms. Sodium restriction, except as a measure that prevents further accumulations, is invariably ineffective. The very low concentrations of sodium in the urine, even before the institution of sodium restriction, are in keeping with the high output of "sodium retaining factor" that is largely or entirely aldosterone.[16] Even if the entire intake of sodium is cut off, a diuresis does not occur. Occasionally a patient will respond to expansion of the plasma volume with colloids, and it has been suggested that restriction of water intake is beneficial. All attempts should be made to correct the underlying disease of the heart, liver, or kidney. No great amount of hope in sodium restriction is justified, and the prognosis for these patients as a group is poor; in our experience one-third to one-half die.[15]

TABLE 1.—*Sample Diet* Containing 50 Mg. of Sodium*

	Amount, Gm.	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Sodium, Mg.	Potassium, Mg.
Breakfast						
Orange juice	100	...	...	10	0.5	190
Oatmeal	100	2	...	15	2.0	170
Toast, unsalted	25	2	...	15	1.0	18
Butter, unsalted	10	...	10	...	0.5	0.4
Sodium-free milk	240	8	10	12	6.0	320
Casec	15	13.2	0.3	...	3.0	...
Subtotal		25.2	20.3	52	12.0	698.4
Dinner						
Potatoes	300	6	...	45	2.4	1,230
Green beans	100	1	...	3	0.9	300
Bread	25	2	...	15	1.0	18
Butter	30	...	30	...	1.5	1.2
Sodium-free milk	240	8	10	12	6.0	320
Coca-cola	120	...	...	11.4	1.2	62
Tomato salad	50	...	...	...	1.5	115
Orange	100	...	...	10	0.3	170
Canned peach	100	...	...	20	5.0	31
Casec	15	13.2	0.3	...	3.0	...
Subtotal		30.2	40.3	116.4	22.8	2,247.2
Supper						
Bean soup	300	5	...	15	1.0	1,300
Macaroni	300	19.5	1.9	114	1.5	240
Bread	25	2	...	15	1.0	18
Butter	10	...	10	...	0.5	0.4
Sodium-free milk	240	8	10	12	6.0	320
Coca-cola	120	...	...	11.4	1.2	62
Green peppers	as desired	...	...	...	...	...
Cucumber	50	...	...	...	0.5	115
Banana	100	...	...	20	0.5	420
Pears, raw	100	...	...	15.8	2.0	100
Casec	15	13.2	0.3	...	3.0	...
Subtotal		47.7	22.2	203.2	17.2	2,575.4
Total		103.1	82.8	371.6	52.0	5,521
mEq.					2.2	141.5

*Supplemented with iron and vitamins and containing 2,644 calories.

During Adrenocortical Steroid Therapy.—Diets extremely low in sodium (30 to 50 mg.) are completely effective in preventing the sodium accumulation that accompanies the use of corticotropin (ACTH), cortisone, and hydrocortisone.[12] As a matter of fact, in previously edematous patients a diuresis may occur during the course of such treatment. In our experience, such diets are well tolerated by children, and hospitalized adults abide by the regimen without undue distress for months. Such marked sodium restriction does not prevent the steroid-induced rise in blood pressure observed in some three-quarters of such patients, nor does it cancel the tendency to hypokalemia and alkalosis.[6] Potassium supplementation is usually not necessary, since the low-sodium diets already contain some 150 mEq. of this ion.

Practicalities and Hazards of Low-Sodium Diets

Tables 1, 2, 3, and 4 indicate constituents that may be included in diets containing 30, 50, and 200 mg. of sodium.[6] Though expressed as sodium chloride, the actual chloride content of these diets is not known. The acceptability of such diets is largely dependent on the benefits they confer on the patient, on the ingenuity of the dietitian or housewife, and on the use of sodium chloride substitutes. A number of useful volumes on low-sodium cookery are available for this purpose. If salt substitutes are used in conjunction with diets limited in sodium, their composition should be scrutinized when potassium restriction is also necessary. Iron and vitamins must be included in all these regimens if low-sodium diets are to be used for more than a few days.

The rice diet introduced by Kempner[17] or a low-sodium, dialyzed milk formula fortified with carbohydrate may also be used for purposes of sodium restriction.[6] The rice diet is low in protein (25 Gm.), but this quantity permits attainment of nitrogen balance. Monotony, however, is a major problem with both of these regimens.

In some patients, the sodium content of the diet may be liberalized somewhat by intermittent use of diuretics and by prescribing the acidifying forms of the cation exchange resins. The latter should be given in dosages of 40 to 60 Gm. each day for several days at a time, the potassium-containing form should be avoided if potassium accumulation is a problem.[18] The ammonium types should not be employed in patients on the verge of hepatic coma.

TABLE 2.—*Other Constituents Used in a Diet,* Containing 50 Mg. of Sodium*

Beverage		Coca-cola, fruit juices, sodium-free dialyzed milk, water
Cereal	Cooked:	Cream of wheat (plain), corn meal, oats (rolled), Ralston, Wheatena
	Dry:	Puffed rice, puffed wheat, shredded wheat
Fruit	Fresh:	Any fresh fruit except cantaloupe
	Canned:	Applesauce, apricots, cherries, grapes, peaches, pears, pineapple, prunes, dates, figs (raw or canned), lemon juice
Vegetable		Asparagus (fresh or frozen), beans (dry, navy, fresh or frozen green, fresh lima, soy), corn on cob (fresh), cranberries, cucumbers, eggplant, lentils, lettuce, onions, peas (fresh), peppers (green), potatoes, tomatoes, rice
Miscellaneous		Bread (unsalted), butter (unsalted), casec, cinnamon, cloves, cocoa (American process), coconut (fresh or unsalted), cornstarch, flour, honey, jelly, macaroni, mustard, Necco wafers, nuts (unsalted), peanut butter (unsalted), pepper (black), popped corn (unsalted), vinegar, spaghetti, Spry, sugar

*Variety has been added to diet by use of readily available proprietary handbooks describing use of protein supplements modified, when necessary, by eliminating those ingredients that would increase sodium content of diet above 50 mg. All foods to be cooked without addition of salt. Diet must be supplemented with iron and vitamins.

The chief hazard of sodium-restricted diets is the depletion of the sodium ion. Depletion may occur abruptly as a consequence of extrarenal losses of this ion in diarrhea, vomiting, other gastrointestinal drainage, or sweating. Circulatory collapse or water intoxication with convulsions may then result. Under such circumstances, the regimen should be discontinued immediately and sodium salts and plasma or plasma substitutes administered. In addition, patients on exchange resins may develop potassium depletion and deficits of multivalent cations such as calcium and iron.[18] This can be avoided by interrupted programs of administration.

Summary and Conclusions

In any patient with edema, the therapeutic goal is the attainment of a negative balance of sodium chloride and water. Regimens restricted in sodium either in the form of the rice diet, dialyzed milk formulas, or diets containing 30, 50, 200, or 800 mg. of sodium chloride often result in a diuresis in patients with congestive heart failure, cirrhosis, renal failure, or toxemia of pregnancy. In prolonged usage, sodium-restricted diets are monotonous and prove burdensome. It should be remembered that some patients respond to slight or moderate sodium-restricted diets, especially if the underlying cause can be corrected. Cation exchange resins in the appropriate cycle and diuretics may prove to be effective adjuvants in such patients.

TABLE 3.—*Diet* Containing 200 Mg. of Sodium*

Beverage	Low-sodium milk (2 cups), tea, fruit juice, Coca-cola, cocoa (American process) made with low-sodium milk or water
Bread	Yeast bread or rolls made without salt or milk, as desired
Cereal	Cooked, without salt, as desired; puffed wheat, puffed rice, shredded wheat
Fat	Any unsalted fat, as desired
Fruit	As desired (limit cantaloupe and dried figs to 1 serving)
Meat or alternate †	Egg (limit to 1 a day), meat or fish (5 oz. cooked weight), any fresh meat (except kidney, liver), any fowl, any fresh fish, oysters
Potato or alternate	As desired
Seasoning	Any except salt
Soup	Cream soups, made from allowed foods
Dessert	Made from allowed foods, such as unsalted fruit pie, fruit tapioca, cornstarch pudding
Sweets	Jam, jelly, honey, maple sirup, white sugar, as desired
Vegetable	1 cup of fresh or frozen or canned without salt; asparagus, green beans, wax beans, lima beans (fresh),‡ navy beans, peas (fresh),‡ tomatoes, soy beans, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, rutabagas, turnips, parsley, cowpeas, eggplant, endive, lentils (dry), squash, corn, lettuce, parsnips

* No salt, soda, or baking powder used in the preparation of any foods.

† No meat juices, broths, or gravies are to be used.

‡ Frozen lima beans and peas are salted.

TABLE 4.—*Sample Diet* Containing 30 Mg. of Sodium*

	Amount, Gm.	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Sodium, Mg.	Potassium, Mg.
Breakfast						
Orange juice	50	...	...	5	0.25	95
Oatmeal	50	1	...	7.5	0.5	85
Toast, unsalted	12.5	1	...	7.5	0.5	9
Butter, unsalted	5	...	5	...	0.25	0.2
Sodium-free milk	140	4	5	6	3.0	160
Casec	10	8.8	0.2	...	1.0	...
Subtotal		14.8	10.2	26.0	5.50	349.2
Dinner						
Potatoes	100	2	...	15	0.8	410
Green beans	50	1	...	1.5	0.45	150
Bread	25	2	...	15.0	1.0	18
Butter	20	...	20	...	1.0	0.8
Sodium-free milk	240	8	10	12.0	6.0	320
Coca-cola	120	...	...	11.4	1.2	62
Tomato salad	50	...	...	...	1.5	115
Orange	100	...	...	10.0	0.3	170
Casec	5	4.4	0.1	...	1.0	...
Subtotal		17.4	30.1	64.9	13.25	1,245.8
Supper						
Bean soup	100	1.2	...	5	0.3	433
Macaroni	150	9.8	0.8	57	0.7	120
Bread	25	2.0	...	15	1.0	18
Butter	10	...	10	...	0.5	0.4
Sodium-free milk	120	4	5	6	3.0	160
Coca-cola	60	...	...	5.7	0.6	31
Green peppers	as desired	...	...	...	...	...
Cucumber	50	...	...	...	0.5	115
Pears, raw	50	...	...	7.9	2.0	100
Casec	10	8.8	0.2	...	2.0	...
Subtotal		25.8	16.0	96.6	10.6	977.4
Total		58.0	56.3	187.5	29.35	2,572.4
mEq.					1.3	66

* Supplemented with iron and vitamins and containing 1,490 calories.

There exists, however, a group of edematous patients with low levels of sodium in their serum in whom none of these measures proves effective. In these forms of the low-salt syndrome, the mechanisms regulating the concentration, volume, and distribution of body fluids are operating at new settings, or homeostasis is disturbed. These have been called "new steady states." The edema does not respond to sodium restriction, because the renal conservation of filtered sodium is virtually complete as a result of increased amounts of sodium-retaining factors that consist largely or entirely of the mineral-regulating adrenocortical steroid, aldosterone. In such patients, the concentration of sodium cannot be returned to normal by sodium administration. The chief therapeutic attack should be directed at the underlying disease of the heart, liver, or kidney. In some patients, however, expansion of the plasma volume may control the edema, and it has been suggested that water restriction may be of benefit.

Rigidly restricted diets may prove beneficial in the control of hypertension, though antihypertensive drugs are more effective in this regard. Sodium-restricted diets are also beneficial as a prophylaxis in patients prone to develop edema, as in pregnancy or in those receiving adrenocortical steroids or other agents that lead to sodium retention.

The hazards of sodium restriction are those of sodium depletion, usually via extrarenal routes, with circulatory collapse, renal failure, and a tendency to convulsions resulting from the attendant hyponatremia. The clinician must be alert to the premonitory signs of the salt depletion type of low-salt syndrome. These may consist of mental changes such as confusion, decreases in urine output, or a rising level of blood nonprotein nitrogen or blood urea nitrogen.

The effectiveness of a sodium-restricted regimen may be judged by the patient's responses, such as diuresis, weight loss, decrease in edema, or improvement in clinical status; however, the failure to observe any of these changes does not necessarily mean the patient is not following the diet assiduously. Measurements of urinary sodium output may detect incomplete adherence in those patients in whom secondary aldosteronism is not pronounced. The use of low-sodium diets requires a definition of the mechanisms operative in any particular instance of edema, an appropriate degree of sodium restriction, the use of adjuvants such as exchange resins and diuretics, and an awareness of the adverse effects of sodium depletion.

References

1. Meneely, G. R.: Relation of Sodium Intake to Blood Pressure, Tr. Am. Coll. Cardiology **4**:278-280 (April) 1955.

2. Winkler, A. W.; Danowski, T. S.; Elkinton, J. R.; and Peters, J. P.: Electrolyte and Fluid Studies During Water Deprivation and Starvation in Human Subjects and Effect of Ingestion of Fish, of Carbohydrate, and of Salt Solutions, J. Clin. Invest. **23**:807-815 (Sept.) 1944.

3. Conn, J. W.: Electrolyte Composition of Sweat: Clinical Implications as Index of Adrenal Cortical Function, Arch. Int. Med. **83**:416-428 (April) 1949.

4. Emerson, K., Jr.; Kahn, S. S.; and Jenkins, D.: Role of Gastro-intestinal Tract in Adaptation of Body to Prevention of Sodium Depletion by Cation Exchange Resins, Ann. New York Acad. Sc. **57**:280-290 (Nov. 11) 1953.

5. Rauschkolb, E. W., and Farrell, G. L.: Decreased Aldosterone Secretion in Decapitated Dogs, J. Clin. Endocrinol. **16**:915-916 (July) 1956.

6. Elkinton, J. R., and Danowski, T. S.: Body Fluids: Basic Physiology and Practical Therapeutics, Baltimore, Williams & Wilkins Company, 1955, chap. 9, 13, 19, and appendix.

7. Chapman, C. B.; Gibbons, T.; and Henschel, A.: Effect of Rice-Fruit Diet on Composition of Body, New England J. Med. **243**:899-905 (Dec. 7) 1950.

8. Achard, C., and Loeper, M.: Sur la rétention des chlorures dans les tissus au cours de certains états morbides, Compt. rend. Soc. biol. **53**:346, 1901.

9. Danowski, T. S.: Electrolytes and Congestive Failure, Ann. Int. Med. **37**:453-464 (Sept.) 1952.

10. Gabuzda, G. J.; Traeger, H. S.; and Davidson, C. S.: Hepatic Cirrhosis: Effects of Sodium Chloride Administration and Restriction and of Abdominal Paracentesis on Electrolyte and Water Balance, J. Clin. Invest. **33**:780-789 (May) 1954.

11. Danowski, T. S., and Mateer, F. M.: Therapy of Acute and Chronic Glomerulonephritis, J. Chron. Dis. **5**:122-137 (Jan.) 1957.

12. Greenman, L.; Weigand, F. A.; and Danowski, T. S.: Therapy of Nephrotic Syndrome: Sodium Restriction, Dextran, and *Corticotropin (ACTH) Alone or Combined with* Nitrogen Mustard, A. M. A. Am. J. Dis. Child. **89**:169-181 (Feb.) 1955.

13. Talbot, N. B., and others: Application of Homeostatic Principles to Management of Patients with Marked Impairment of Renal Function, A. M. A. J. Dis. Child. **92**:476-478 (Nov.) 1956.

14. Page, I. H., and Corcoran, A. C.: Dietary Treatment of Hypertension, J. Clin. Nutrition **1**:7-16 (Sept.-Oct.) 1952.

15. Danowski, T. S.; Fergus, E. B.; and Mateer, F. M.: Low Salt Syndromes, Ann. Int. Med. **43**:643-657 (Oct.) 1955.

16. Luetscher, J. A., Jr., and Curtis, R. H.: Aldosterone: Observations on Regulation of Sodium and Potassium Balance, Ann. Int. Med. **43**:658-666 (Oct.) 1955.

17. Kempner, W.: Treatment of Hypertensive Vascular Disease with Rice Diet, Am. J. Med. **4**:545-577 (April) 1948.

18. Greenman, L.; Shaler, J. B.; and Danowski, T. S.: Biochemical Disturbances and Clinical Symptoms During Prolonged Exchange Resin Therapy in Congestive Heart Failure, Am. J. Med. **14**:391-403 (April) 1953.

THE CAROTID SINUS.—The carotid sinus is a bulbous dilation of the first portion of the internal carotid artery. The tunica adventitia of the sinus is thicker than the tunica adventitia of the rest of the artery, and contains special nerve cells or "nerve receptors" situated between the layers of collagen. Pressure-sensitive fibers of the glossopharyngeal ("nerve of Hering"), hypoglossal, vagal, and cervical sympathetic nerves are generally believed to carry afferent impulses to the vasomotor and cardio-inhibitory centers in the reticular formation of the medulla. From here the impulse traverses the central synapses and, after crossing, passes contralaterally as a motor impulse toward the periphery through widespread autonomic nerve pathways, namely the vagus, the sympathetics, and the central motor pathways. The type of response, therefore, depends primarily on the direction of the motor responses induced. Normally, the carotid sinus is concerned with regulation of blood pressure and cardiac rate, and mechanical pressure will cause slight slowing of pulse with concomitant slight fall in blood pressure. In patients in whom the carotid sinus reflex mechanism is abnormally sensitive, however, mechanical stimulation produces marked symptoms.—R. E. Roscoe, M.D., C. P. Faller, M.D., and K. E. Quickel, M.D., The Treatment of the Carotid Sinus Syndrome, *The American Journal of Cardiology,* September, 1958.

MEDICINE AT WORK

- *Doctors Aid Book-Learning*
- *5 Health Groups with 1 Aim*
- *Planning Indigent Care*
- *Case of the Vanishing Rent*
- *Christmas Giving Via AMEF*
- *Quiz 10,000 Lawyers*
- *Study Mobile Health Units*

Coffins, Costs, and Care

"I think one reason hospital costs are going up and have gone up is that the patient now comes out on his own two feet, instead of in a coffin."

That is the opinion of U. S. Congressman Thomas B. Curtis of Missouri. He goes on to say, "People get an awful lot more for one dollar of medical and hospital care today than they ever got before." Curtis believes that the increased cost of living today indicates, in many cases, an increase in the quality and standard of living. Among these increases are better medical care and longer life.

These same years of added life, however, are levying a tax of inflation on America's older citizens, thus creating an economic problem, the Congressman said. His suggested solution: Modern nursing homes which can care for the aged at a reduced rate.

Government, Curtis said, will always play an active role in solving social problems, but he stresses the individual's role in bringing about improvements and he urges medicine to take an interest in governmental activities at the "grass roots" level.

In a final word of advice to physicians assembled at the A. M. A.'s recent PR Institute, Curtis said: "Keep a broad outlook, get the word out on specific issues, and give Congressmen the benefit of your beliefs and honest debate."

Doctors Start Acting to Foster Scholarship Among Teenagers

Academic achievement has become a national resource—and physicians of at least one county medical society are putting those words into action.

Within a few weeks, thanks to leadership by members of the Adams County Medical Society at Quincy, Ill., another incentive to improved high school scholarship in that community will be established. The first annual cash awards of $100 each and engraved gold keys will be presented to the boy and the girl who earned the highest grades—with emphasis on academic subjects—during the past year in the six high schools of Quincy and Adams county.

This so-called Doctor's Plan of awards, made possible by an anonymous Quincy physician, is the latest of several steps taken under medical society initiative in recent years to counteract a public school tendency of promoting sports and extracurricular activities at the expense of book learning. The growing movement in Illinois was inspired by a group of Fort Dodge, Iowa, physicians who launched a campaign in 1954 "to promote and popularize scholarships as the principal objective of schools." Those doctors created the Fort Dodge Foundation for Academic Achievement, which honors top scholars of the community's two high schools at a banquet each spring.

Two years after the successful Fort Dodge effort began, the Kiwanis Club of Quincy (which has nine physician members) and the club's Swanberg Kiwanis Foundation (brain child of Dr. Harold Swanberg, a radiologist in the community) organized the Quincy Major Learning Program—"dedicated to a college education for every talented high school graduate of Quincy and Adams county." The president of the foundation is Dr. Warren F. Pearce, an internist.

Through the spoken and the written word, that program is hammering home the point that a "crisis in education" (see box) could cause this nation to lose "the cold war of the classrooms." Physicians, teachers, businessmen, parents, local government officials, Kiwanis Club members in many fields of endeavor—all have been intent upon doing everything possible to identify superior and talented high school students and to guide and motivate them to secure a college education. All have been emphasizing the fact that presently half of this nation's brightest high school students do not go to college. Those were the words and aims in Quincy. So far, these are the actions, too:

—The Adams County Medical Society has established annual awards of certificates for up to 10% of the boys and 10% of the girls of local high

Fig. 1.—These students, competing for college scholarships in Illinois, personify the successful efforts of many individuals and groups—including physicians and their medical societies—to promote academic achievement as a higher priority goal for teenagers.

What Others Say About Our "Crisis in Education"

"In [Soviet] education the spirit is a race for knowledge, for supremacy in a way of life and world leadership. They are convinced that time is on their side and they can win world supremacy through education and hard work. We as a nation cannot afford to disregard the challenge imposed upon us by the Russian race for knowledge." —Dr. Lawrence G. Derthick, U. S. Commissioner of Education

"There is no substitute, in preparatory education, for the rigorous study of fundamentals in mathematics, English, a foreign language, science, history and social studies."

—Dr. Milton Eisenhower, President of Johns Hopkins University

"Every [high school] student must take four years of English, four years of social studies, two years of mathematics, two years of science."

—Dr. James B. Conant, former President of Harvard University

"English, foreign languages, science, mathematics, and history are the things that every high school student needs. All of us have to live in a modern world where things are fundamental. All are citizens and must use intelligence in making decisions, otherwise the nation is headed for disaster."

—Dr. Arthur Bestor, Professor of History, University of Illinois

school graduating classes who achieve highest grades (with emphasis on performance in academic subjects). The certificates are presented at joint luncheon meetings given by the medical society and the Kiwanis Club.

—Last summer 82 local high school teachers attended workshop sessions on guidance counselling, conducted by Western Illinois University and financed by grants from the Quincy Board of Education and the Swanberg Collegiate Educational Fund of the American Medical Writers' Association.

—Scholarship opportunities, particularly those offered by the State of Illinois (fig. 1) have been publicized broadly in the Quincy area as added incentives to academic achievement. Last month the Quincy Major Learning Program scheduled four television, school, and luncheon meeting talks in Quincy for the associate director of the Illinois State Scholarship Commission.

—Literature on scholastic incentives and current scholarship opportunities is being sent free of charge to parents in Adams county and to high school students.

—Local high school seniors who score high in National Merit Scholarship tests are praised in published items, such as one distributed last month under the headline "Quincy Is Proud of Four Quincy Senior High School Seniors."

—A program is under way to acquaint other county medical societies and community organizations with the great public service potential of projects similar to the ones in Fort Dodge and Quincy. Under this program, for example, Dr. Swanberg is scheduled to address a group of community leaders in Kirksville, Mo., later this month (Dec. 18). In addition, an exhibit of the Quincy Major Learning Program has been shown before several local and national Kiwanis groups, the Illinois State Medical Society, the Mississippi Valley Medical Society, the American Medical Writers' Association, and other organizations.

The Broader Picture

Already, these activities sparked by physicians in Iowa and Illinois are being reinforced on a national scale. Last March, for example, the Commission on Research and Service of the accrediting North Central Association of Colleges and Secondary Schools received a grant of $174,000 from the Carnegie Corporation of New York to conduct a two-year research project whose purpose is identical to that of the pioneering medical society efforts: "To find, develop, and implement procedures and programs in secondary schools which will identify, guide, and motivate as many as possible of the superior and talented students in all fields of learning to desire, plan for, and acquire a thorough college education."

Meanwhile, physician concern generally in public school education is rising on an individual basis throughout the nation. This is shown in the latest biennial survey report of the A. M. A. Council on Medical Service, which indicates that more and more physicians are serving on their local school boards. Such community service, of course, is both typical and traditional for the medical profession (see Medicine at Work, THE JOURNAL, March 16, 1957).

All this is gratifying to Dr. Swanberg. He says: "What a wonderful achievement it would be for the nation if county medical societies all over the country would give high school academic scholarship awards. How well we succeed in educating each child to the maximum of his inherent potential will ultimately determine his fate and our own."

Committee on Indigent Care Plans Study of State Programs

How well are the personal health needs of the indigent and medically indigent being met in your state? Is there an adequate plan for provision of indigent care, or does it depend in great measure on the charitable impulses of physicians?

These are the kinds of questions the A. M. A. Committee on Indigent Care of the Council on Medical Service will be asking constituent societies early next year in an effort to up-date its continuing study of indigent medical care plans begun in 1951. Discussion of the proposed questionnaire took place at a Committee meeting in Chicago Nov. 2. In 1955, the Committee published case studies of indigent care operations in 18 communities selected to indicate variations in approach and medical society participation.

In 1956, the House of Delegates adopted the Committee's "Guides for Medical Societies in Developing Plans for Tax-Supported Personal Health Services for the Needy." How well these guides are understood and how widely they are being used are two areas the new study will cover.

First recipients of the questionnaire will be Committee members who expect to gain insight into the problem by studying the situation in their own states. Field studies of selected areas may begin next spring.

Bill for Indigent Care Anyway?

"Physicians should always bill for indigent care services, even if they do not expect payment, because not to do so is to give public agencies supporting such services an untrue picture of the cost of such care."

This opinion was expressed recently by a participant at a meeting of the A. M. A. Committee on Indigent Care. "Agencies charged with providing medical care for the indigent balk at the cost of providing Blue Cross, Blue Shield, or other kinds of prepayment plans on the ground that present methods of providing medical care are cheaper," he said. "They aren't really cheaper, they just appear to be because many physicians do not bill for services they perform for indigent patients."

Chairman of the Committee on Indigent Care of the Council on Medical Service is Dr. John F. Burton of Oklahoma City. Other members are Drs. A. J. Bowles of Seattle; I. Jay Brightman of Albany, N. Y.; E. P. Coleman of Canton, Ill.; Wesley W. Hall of Reno, Nev.; E. A. Ockuly of Toledo, Ohio; and Dean W. Roberts of Chicago. Consultants are Mr. R. M. Hilliard of Chicago and Mr. Nelson B. Neff of Reno. Mr. George W. Cooley is Staff Secretary.

Five U. S. population centers are known to have central information and referral services for the chronically ill, and the Committee on Indigent Care plans to publish a report on their history, administration, operation, and services later this winter.

The five are located in Chicago, Milwaukee, Cleveland, San Francisco, and Essex County, N. J. These organizations assemble, study, and make available information on existing resources and facilities for the chronically ill. They also have the potential for determining unmet needs, developing coordinated programs, and assisting others in planning facilities and programs.

Planning for Indigent Care Is Obligation of Local Societies

"The medical profession should guide the development and operation of the medical aspects of [indigent care] programs to assure their remaining within proper bounds," the Committee on Indigent Care stated this week in its annual report submitted at the Clinical Meeting in Minneapolis.

To accomplish this, the Committee again urges that state and county medical societies take an active part in the planning and operation of such programs. Its report states: "The Committee plans to gear its future activities to the needs of the various states, providing them with necessary information on laws and existing programs, advice, and consultation when requested."

The Committee is planning more meetings, similar to those offered in the past, at which representatives of state societies will gather to compare and perhaps work out their problems together with the Committee and federal bureau help. Several state associations, according to the Committee, have taken an active part "not only in planning indigent medical care programs, but even in stimulating legislatures and governmental officials to undertake the study of state needs and facilities, preparatory to such programs."

"The Committee feels that there will be a continually increasing interest in medical services in welfare programs," the report continues. "It behooves medicine to work with welfare agencies and to see to it that proper and adequate programs are developed.

"This recommendation does not apply only to those areas where the medical profession receives payment from public funds. Even when the physicians' services are provided through the charity of the individual physician in his office or while he is on staff service at the local hospital, the medical society should still maintain an active interest in the goals, the methods, and the operation of the over-all medical care program."

Five Health Groups with One Aim—Improve Patient Care

What are some of the problems which arise when a New Yorker is moved from a hospital to a convalescent home? How might properly-worded booklets help disturbed patients in South Dakota adjust themselves to hospital routines? How many Rhode Island patients will benefit from knowledge gained by physicians, nurses, and hospital administrators at joint conferences on infections and on rehabilitation techniques?

These and related questions are being answered daily through the activities of special committees in hundreds of hospitals throughout the nation. A pioneer in this movement is the 10-year-old National Joint Commission for the Improvement of the Care of the Patient, which met several weeks ago in New York City to review achievements of similar commissions in 25 states, to elect officers, and to discuss such matters as development of hospital administrators, legal liability in hospitals, and medical house staff orientation. Named chairman for the coming year was Rev. John J. Flanagan, S. J., executive director of the Catholic Hospital Association. Elected as A. M. A. representative to the commission's executive committee was Dr. Cleon Nafe of Indianapolis, a member of the A. M. A. Board of Trustees. Miss Margaret Giffin, director of hospital nursing for the National League For Nursing, was reelected secretary.

The National Joint Commission was created in 1948 as the result of an A. M. A. House of Delegates report. It is organized on the belief that professional people whose work is interrelated and mutually dependent can serve the patient more effectively when there is opportunity for cooperative planning, free discussion of problems, and evaluation of coordinated activities. These joint groups at the national, state, and hospital levels are designed to be advisory only—neither legislative nor setting policy for the parent organization. Members of the National Joint Commission represent the American Hospital Association, the American Medical Association, the American Nurses' Association, the National League for Nursing, and the National Federation of Licensed Practical Nurses. (The New York session last Oct. 24 and 25 was preceded by a meeting of the A. M. A. Committee on Nursing.)

Following are sample activities of the state commissions as reviewed at the National Joint Commission conference:

Arizona—"Gave assistance with legislation pertaining to Nursing Practice Act and intravenous therapy."

Connecticut—[illegible] education costs; legislating for nursing scholarships; developing a licensed practical nurse program.

Kansas—"Acquainting" Blue Cross and Blue Shield with nursing needs and resources.

Nebraska—Presenting programs on rehabilitation and nursing homes.

New York—Promoting regional conferences patterned on the Governor's Conference on Problems of Aging; studying use of intensive care units (see Medicine at Work, THE JOURNAL, April 26, 1958).

South Dakota—Sponsoring workshops on disaster planning, diversional therapy and control of visitors to hospitals; compiling booklet for patients on the "why's" of hospital procedures (see Medicine at Work, THE JOURNAL, Dec. 1, 1956).

Texas—Publishing a health careers booklet, "Deep in the Health of Texas."

Washington—Recommending a permanent advisory committee on drugs and therapeutics.

Extension of the National Joint Commission's aims to state and hospital units was begun five years ago. A similar step was taken this year when the A. M. A. Board of Trustees and the A. H. A. Board of Trustees endorsed a recommendation that every hospital create a Joint Conference Committee made up of representatives from its medical and governing groups "in order that there be a mutual understanding of each other's activities and problems" (see Organization Section, THE JOURNAL, Nov. 1, 1958). That recommendation now is being adopted in hospitals the country over. It, too, inevitably will serve to improve the care of the patient as the health professions keep pace with modern needs.

For, as Peter B. Terenzio, director of the Roosevelt Hospital in New York City, remarked to the National Joint Commission at its October meeting: "Originally, hospitals were places to die, not to get well. They were places for the poor sick, not for sick people generally. Today's hospital is for the care of the patient—everything else is secondary."

Two Minnesota Societies Aim at Home Care for the Chronically Ill

Medical societies in two rural Minnesota counties have joined with other groups in programs to provide chronically ill and disabled patients with home nursing and rehabilitation services.

Wright County's medical society joined a citizens' committee which is cooperating in turn with the state medical association's committee on chronic disease and with the state health department to conduct a house-to-house survey. By late summer, the combined volunteers had recorded 155 persons confined to their homes by chronic illness, 49 of whom were previously unknown to county authorities. More than two-thirds of the number were

65 or older. Forty per cent were suffering from diseases of the heart or blood vessels.

Other groups with representation on the citizens' committee include the board of public health nursing and the county welfare board.

Wright County has already begun a layman's course in nursing care for the homebound. Other recommendations growing out of the survey include:

—Establishing rehabilitation nursing as a service of the county public health program.

—Offering outpatient physical therapy at the community hospital.

—Encouraging a handicraft and recreation center for the aged and the handicapped.

—Assembling a roster of persons qualified to offer home nursing care.

—Establishing evaluation techniques on patient rehabilitation potential.

Seventy miles away, in Steele County, the board of commissioners, cooperating with the county medical society and the public health nursing board, has established a pilot home nursing care program for the homebound ill or disabled.

A licensed practical nurse gives supervised care to patients under a doctor's care. Cost of the visits—up to $3—depends on ability to pay. The program is partially subsidized by the Minnesota department of health.

Query 313 on Medical Care Ideas

The question: Taking everything into account, who do you think is likely to get better medical care—the person in a medical plan in which he chooses the doctor, or the person in a medical plan in which the plan chooses the doctor?

The answer: Seventy-six per cent of the 313 persons interviewed in a national survey said they felt that better care would result if the patient, rather than the medical plan, selected the physician.

Those figures are reported as results of a representative sample of the adult population by Opinion Research Corporation for the American Medical Association.

The results, according to the Opinion Research Corporation, also indicated that a majority of those interviewed:

—Said they felt continuity in a doctor-patient relationship was an important factor in good medical care.

—Said they preferred to choose their own physician even if it meant paying part of their own medical costs.

Detailed reports on the findings were published in two issues (Oct. 20 and Nov. 3) of *The A. M. A. News.*

New Facilities Being Used in Fight Against Alcoholism

Two new facilities to aid those struggling to defeat alcoholism (see Medicine at Work, THE JOURNAL, July 19, 1958) have come into being in recent months. In New York City, three men with $4 and a personal knowledge of the horrors of alcoholic addiction opened Fellowship Center in an 88th Street hotel. And in Birmingham, the Alabama Commission on Alcoholism opened the doors of its first outpatient clinic.

The aim in New York is "to bridge the gap between the attainment of sobriety and a full, useful life." Alabama's stated objective is "to assist (the patient) to regain, not only sobriety, but better health and greater happiness by means of a more ideally adjusted personality."

The Fellowship Center is an outgrowth of one man's self-dedication at a time when he was in a New York jail, a despairing alcoholic. It took five years, but last January, Buford Peterson and two other men who had known similar suffering pooled their petty funds and their impressive faith to rent 14,000 feet of space in a small hotel.

With use of money lent or contributed to the work, Fellowship Center functions primarily to rehabilitate the alcoholic whose home life has been shattered and whose addiction has frequently led to his being imprisoned. Peterson, an alcoholic for 20 years, says: "Sobriety, when first gained, leaves one in a state of weakness, confusion, indecision. Without a helping hand, a lapse looms dangerously."

The Center offers immediate physical necessities, bolsters "sick" morale, helps find work, explains the victim's plight to his family, and pools the wisdom of representatives of public and private agencies.

Alcohol and its influence on personal well-being is being approached on two other levels.

—A seminar on counseling the alcoholic was presented for area clergymen Oct. 24 by the Chicago Committee on Alcoholism. Speakers included Dr. Patrick Israel, psychiatrist and psychiatric director of the committee, and Granger Westberg, professor of religion and health at the University of Chicago.

—In February, an organization to discourage drinking by adolescents—Allied Youth, Inc.—will ask physicians in the U. S., through local chapters, to provide expert discussion leadership at meetings of teenagers. The high school-aged youngsters are encouraged to learn the nature of alcohol with the idea that this will encourage abstention.

Dr. R. C. Boyer, medical director of the New York City Department of Correction, is a member of the board of directors. Other board members and advisors include religious leaders, judges, social workers, and parole officers.

Alabama's establishment of an outpatient clinic—as reported in the *Journal of the Medical Association of Alabama*—marks a change in policy. In 1945, the state created a Commission on Education with Respect to Alcoholism, emphasizing the educational approach. Last year, however, the legislature gave the commission an annual appropriation of $150,000 and called for the establishment of outpatient clinics.

Staffed by a team that uses the multidisciplinary approach found effective in other states, the first clinic accepts patients on self-referral or those who come at the suggestion of physicians, family, friends, clergymen, social agencies, or Alcoholics Anonymous.

Director of the clinic and senior physician is Dr. Edwin M. Fuchs, resident psychiatrist since 1955 at the Philadelphia General Hospital. He is assisted by a part-time internist, a part-time psychologist, and two full-time psychiatric social workers.

New Look in Christmas Gifts

A novel approach to the idea of Christmas giving has been taken by the Arizona Medical Association. It recently approved a resolution asking that the usual donors of small holiday gifts to physicians replace them with contributions to the American Medical Education Foundation. A new AMEF newsletter, "The Foundation," reports that such donations would be expected to replace promotional calendars, desk sets, pens, and other items ordinarily sent to doctors.

The newsletter also reported:

—A gift of $1,000 from the Alaska Territorial Medical Association shortly after statehood was approved for the Territory this year.

—Two gifts from medical societies representing proceeds of polio vaccination programs carried out on a public-service basis. A donation of $2,708 was received from the Nashville Academy of Medicine and the Davidson County Medical Society of Tennessee. Another $1,750 came from the Pueblo County Medical Society of Colorado.

—Plans for the eighth annual meeting of AMEF state chairmen to be held Jan. 24-25 in Chicago.

In the seven years since its founding under AMEF auspices, the AMEF has disbursed to medical schools more than 7 million dollars contributed by physicians and other donors (see Medicine at Work, THE JOURNAL, April 20, 1957).

Case of the Disappearing Rental Illustrates Question in Ethics

The Case of the Druggist and the Disappearing Rental is not a new Whodunit, but it forms an example of the type of ethical problem the A. M. A. Judicial Council feels should be handled by the county society.

The case, cited as part of the Council's annual report submitted this week at the Clinical Meeting in Minneapolis, involved a proposed contract for office rental sent to the Council by an unnamed physician. The office space was owned by a druggist and located in the same building as his own drugstore. Rental was to be $1,000 a month, but would be reduced on a sliding scale, depending on the number of prescriptions filled for the doctor's patients.

The Council's report said: "If the physician sent the druggist an average of 10 prescriptions a day the rent would be $900 a month; if he sent 20 a day, rent would be $800. With each daily increase of 10 prescriptions by the physician, the druggist agreed to reduce the monthly rental by $100 until the rental would be $1 a month if the physician sent the druggist an average of 100 prescriptions a day."

Is this unethical? It certainly is according to the report, which also stated: "The component society is an autonomous group and as such one of its principal duties is to apply ethical principles. Apparently this obligation is not recognized . . . or is, at best, not accepted as a principal obligation. The Council has noted a failure on the part of physicians to turn to their county societies concerning the application of ethical principles and the failure of county societies to be more aggressive in developing a sound program of ethics."

The Council receives numerous letters containing statements similar to this: "One of the doctors on the staff of our hospital is in doubt concerning an ethical problem. Will you please advise me so I can tell the doctor what his conduct should be?"

"Why should a doctor go to a hospital administrator with a question of ethics?" the report asks. "Why should the hospital administrator accept the responsibility? How often do hospital personnel . . . resolve or attempt to resolve questions of ethics?"

The Council believes that "if medical societies fail to accept and discharge their obligations in matters of ethics others will assume these obligations by default."

The report urges "county and state societies to adopt a critical attitude toward their programs to 'uphold the honor and dignity' of the profession of medicine. These programs must be based on a sound knowledge and understanding of ethical principles." To aid societies in this regard the Council has distributed this past year representative opinions and interpretations of the "Principles of Medical Ethics," so that members now have a "collection of precedents to which they may turn when it becomes necessary to evaluate the ethical propriety of particular conduct."

Medical Leadership in Time of Disaster

"I know of no profession or group that is more dedicated to the cause of civil defense than is the American Medical Association. It is a good thing for all of us that you are, for it is with you, and all others so strategically situated, that our civil defense effort will succeed, or fail."

With these words, Leo A. Hoegh, Director of the Office of Civil and Defense Mobilization, keynoted the ninth County Medical Societies Civil Defense Conference in Chicago early last month. Attended by more than 200 persons representing 31 states, the conference offered speakers on such subjects as federal and local CD planning, biological and chemical warfare, public health disaster problems, the role of paramedical services, and reports on three disaster exercises. In addition, workshop sessions were held to discuss specific problems in mass casualty care.

Selected comments by speakers at the two-day conference—sponsored by the A. M. A. Committee on Civil Defense, Council on National Defense—include:

Dr. Carroll P. Hungate, member, Council on National Defense—"To properly handle the medical effects of nuclear weapons was, long ago, recognized as the greatest organizational challenge to American medicine in the 20th century. We are meeting this challenge, and our results are reflected in the better handling of natural disasters, new awareness of the effects of radiation in industry, medicine, research, and from atomic sources."

Col. Ingalls H. Simmons, Director, Department of Preventive Medicine, Army Medical Service School—"If you are out walking in the street when a bomb goes off, fall flat, face down, immediately. This is going to be a big American problem, because we are just too curious. Curiosity pays dividends in some ways, but at the time of a thermonuclear bomb, it certainly will not pay you to look around to see what is happening."

Russell W. Bunting, DDS, Dental Consultant, OCDM—"For the past seven years, the dentists of this country have been placed in an equivocal position. They have been told that their basic medical training, their experience with handling patients in severe pain, and their cooperation with medicine in the care of their patients makes them high priority professional personnel. But, as yet, organized medicine has made no official statement to sanction or support . . . allied professional training."

"Every home and eating place, as well as many office buildings, have several sources of emergency water supply which might well be forgotten in the confusion of a disaster," Col. Ingalls H. Simmons told those attending the ninth County Medical Societies Civil Defense Conference in Chicago last month.

Water heaters, the flush tanks of toilets, ice cube trays, water bottles, and canned fruits and vegetables packed in water are all safe and protected sources for the seven gallons per person that is the minimum weekly ration, he said. Col. Simmons is the Director of the Department of Preventive Medicine of the Army Medical Service School at Fort Sam Houston in Texas.

Dr. Gunnar Gundersen, president, American Medical Association—"I believe that every physician has a responsibility to prepare himself, and to participate in disaster planning in his community. Nurses, paramedical personnel, hospital clerical personnel, ambulance drivers, rescue workers, and others will look to the physician for guidance in performance of duties in the disaster situation. It is the physician who must coordinate the activity of these persons."

Dr. Paul S. Parrino, Director, Biophysical and Medical Sciences Office, OCDM—"It is necessary to explore the biological, physiological, and psychological factors involved in living in shelters. This is necessary to know the vital and immediate medical problems that might arise. We need to know the effects of group living in close space for long periods of time."

Disaster Plan Developed for Metropolitan Kansas City Area

A comprehensive disaster plan for the metropolitan Kansas City area is now ready for use. In reporting this fact Sept. 13 to the A. M. A. Committee on Civil Defense and regional medical representatives in Boston, Dr. Carroll P. Hungate, a member of the committee, said that workability of the plan depends on whether satellite communities accept the Kansas City mayor as head of the program and community officials as his deputies. The mayor's role in the plan had been recommended by the governor of Kansas.

The plan visualizes fire stations as centers for the organization of disaster units, which would include physicians and other health and medical personnel.

To implement its planning, Kansas City in September began a Light Rescue course open to men and women at 25 fire stations. Instruction will be headed by fire captains specially trained in the work. Other courses, planned for later dates, will include such subjects as first aid and survival.

Double-Duty Ambulance

An ambulance, like an insurance policy, is purchased with an eye toward the emergency situation, but it can be made to serve more than double duty. Proof is the eight-patient vehicle designed by Dr. Thomas F. Nevins Jr., plant physician of the Linden, N. J., refinery of Esso Standard Oil Company.

Built on a five-ton truck chassis, the ambulance has every emergency facility but is used also for mass inoculations, a safety eyeglass program, and as a mobile first aid station for the company's occupational health program.

In addition to the standard ambulance equipment, Dr. Nevins' brain child includes a 110-volt generator, a recording and PA system, gas and oxygen masks, a built-in oxygen supply, and a portable resuscitation unit with remote controls.

Perhaps best of all, the unit cost only about $16,000. "A regular one-patient station wagon type costs at least $12,000," Dr. Nevins says.

Newark News Photo

Committee Studying Mobile Units in Employee Health Programs

The role of mobile units in employee health programs and the range of services they provide are being studied by the A. M. A. Committee on Medical Care for Industrial Workers, according to the Committee's annual report submitted this week at the Clinical Meeting in Minneapolis. Units have been broadly categorized by the Committee on the basis of the following service arrangements and ownership:

—Those operated by a labor union as a fringe benefit resulting from collective bargaining for members located in numerous small plants within a state. They are staffed by a medical case worker and a clinical laboratory technician who perform tests evaluated by the physician in charge of the program. General nature of the findings is reported to the person examined and a report is usually sent to his personal physician. Companies serviced by these units have no occupational health programs of their own.

—Units which are a part of a management-sponsored program that tour company installations in several states where no plant physicians are employed. An examining physician and a technician conduct a variety of tests and immunizations. Findings are reported to the family physician and to the company's central medical office.

—Those operated by a physician-owned service and offered to industry on a contractual basis. Screening examinations are done by local physicians hired for the purpose.

—Units operated by a nonprofit organization formed jointly by management, labor, and professional groups to serve a geographic area. Industry pays a fixed amount per employee for annual multiphasic examinations. If tests reveal need for medical care, the employee is referred to his own physician.

According to the annual report, the Committee plans to study mobile units in greater detail "particularly in determining to what extent is the screening of employees for the express purpose of detecting nonoccupational diseases properly a part of an occupational health program."

Chairman of the Committee on Medical Care for Industrial Workers is Dr. Frank J. Holroyd of Princeton, W. Va. Other members are Drs. Leo Price of New York City; Edwin P. Jordan of Charlottesville, Va.; William A. Sawyer of Rochester, N. Y.; Clyde Sparks of Ashland, Ky.; Frederick Slobe of Chicago; Thomas J. Danaher of Torrington, Conn.; and Melvin N. Newquist of New York City. Staff research associate is Mr. Murray Klutch of Chicago.

CIH Works on Immunization Guide

Defining the role of industrial medical departments in the matter of immunization has posed an increasing problem in recent years—a problem for which an A. M. A. committee hopes to have an answer soon. The Committee on Industrial Health Emergencies of the Council on Industrial Health is working on a "Guide for Industrial Immunization Programs," it was reported at a meeting of the Council held Sept. 4-7 in Portland, Ore.

The Council also heard:

—That its Committee on Industrial Health Emergencies will poll 69 selected industrial health departments asking details on their handling of employee immunization during last year's Asian influenza epidemic. The survey is being made at the request of the A. M. A. Special Committee on Influenza as a part of the development of a standby program for use in future mass immunizations.

–Vice Chairman Robert A. Kehoe warn that the Council must soon be prepared to offer a statement on the principles of undergraduate training in occupational medicine.

–A discussion of plans for the 19th Annual Congress on Industrial Health to be held in Cincinnati Feb. 16-18. Theme of the congress will be "Occupational Medicine–Education, Research, and Practice."

Chairman of the A.M.A. Council on Industrial Health is Dr. William P. Shepard of New York. Vice Chairman is Dr. Robert A. Kehoe of Cincinnati. Other members are Drs. V. C. Baird of Houston; John N. Gallivan of East Hartford, Conn.; Rutherford T. Johnstone of Los Angeles; E. S. Jones of Hammond, Ind.; Lemuel C. McGee of Wilmington, Del.; Melvin N. Newquist of New York City; Paul S. Richards of Salt Lake City; Oscar A. Sander of Milwaukee; Charles F. Shook of Toledo; and James H. Sterner of Rochester, N. Y. Dr. B. Dixon Holland is Staff Secretary.

Opinions of 10,000 Lawyers Sought in Medicolegal Study

When the A. M. A. Legal Department surveys 10,000 attorneys this winter on matters of mutual interest, it will be the second phase of a long-range study of medical professional liability. The first phase polled some 7,500 physicians on their experiences in the area of malpractice. Both studies illustrate the increasingly close relationship of law and medicine (see Medicine at Work, THE JOURNAL, Dec. 15, 1956).

Questions will be in the areas of interprofessional relations, medical professional liability, and expert medical testimony. Realizing that attorneys' professional contacts with physicians vary widely, the questionnaire will also include a section to determine the individual experience that lawyers have had with doctors in their work.

Experiences and common goals relating to medicine and law led to the formation, in 1957, of a joint national medicolegal committee composed of representatives from both the A. M. A. and the American Bar Association. That committee drafted a National Interprofessional Code for Physicians and Attorneys, a guide for relationships between the two professions in legal procedures.

The Code was adopted by both the A. M. A. and the A. B. A. at their annual meetings this year. Calling for implementation at local levels (see Organization Section, THE JOURNAL, Aug. 23, 1958), the Code lays down suggested procedures in such areas as subpoenas, pretrial medical reports, court appearances, fees, and complaints.

Research and Specialism Will Highlight Education Congress

> Nothing out of its place is good and nothing in its place is bad. –Walt Whitman
>
> The origin of all science is in the desire to know causes; and the origin of all false science and imposture is in the desire to accept false causes rather than none; or, which is the same thing, in the unwillingness to acknowledge our own ignorance. –William Hazlitt

Those two quotations–the first signifying specialization and the second research–have been cited as keynotes for the 55th Annual Congress on Medical Education and Licensure when it convenes at the Palmer House in Chicago next Feb. 7 through 10. The Congress is sponsored by the A. M. A. Council on Medical Education and Hospitals in cooperation with the Association of American Medical Colleges, the Advisory Board for Medical Specialties, and the Federation of State Medical Boards of the United States. In carrying the themes of "Specialization in Medicine" and "the Role of Research in the Education of all Physicians," presentations and workshop sessions will explore such topics as:

–Specialism in relation to modern society, medicine, the pursuit of excellence, and the various phases of graduate medical education.

–General educational values inherent in the experimental method.

–The role of research in educational objectives of clinical and basic medical sciences and in graduate medical education.

–Research orientation relating to teachers and practitioners of medicine.

The Annual Congress last February attracted more than 1,000 medical educators and others in a program which highlighted the theme of medical education challenges and future needs. A detailed program for the coming Congress will appear in a future issue of THE JOURNAL.

There's That Word Again–

The word is serendipity–finding something valuable without deliberately looking for it–and on Jan. 18 physicians are scheduled to meet with scientists from other disciplines to discuss the imposing influence of "happy accident" phenomena. The "Bahamas Serendipity Session" at Nassau, believed to be the first of its kind, was arranged by Dr. B. L. Frank of Montreal. He says it was suggested by data reported in a Medicine at Work article in THE JOURNAL last Dec. 21. At last report, the program still was being compiled. Notices were sent to researchers in such fields as cybernetics, pharmacology, biophysics, bacteriology, and hydraulics.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . AUSTIN SMITH, M.D.
Associate Editor . . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

•

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

"IMMUNE" OR "NO TAKE" REACTION IN SMALLPOX VACCINATION

DURING the American occupation of Japan at the end of World War II, and during the Korean conflict, some of our American military personnel contracted smallpox.[1] The unique situation was that these servicemen had been vaccinated against the disease and possessed records showing "successful" vaccination.

Epidemiologic investigations revealed that many of these so-called vaccinated soldiers' records showed "immune reaction," "no reading," "no reaction," or "no take." The term "immune" reaction should never be considered as evidence of a successful vaccination. While the phrase is used by some physicians when they see no physical signs at the site of inoculation, a negative reaction is more likely the result of improper preparation of the site of vaccination, a vaccine that has lost its potency (because of being outdated or more probably due to improper storage), or faulty technique in the actual vaccine process. The best clinical evidence seems to indicate that, even after a recent vaccination, revaccination if properly administered with potent vaccine will cause a demonstrable lesion at the vaccination site.

The "early" or "immediate" reaction develops in virtually all persons who have ever had a primary vaccinia take and is an allergic reaction to the vaccinia antigen and not related to the infectivity of the vaccine applied. In partially immune or susceptible individuals who have had a prior vaccination, such an allergic reaction to revaccination with potent live virus then subsequently proceeds to a vaccinoid reaction. Heat-inactivated smallpox vaccine can produce, in revaccinated persons, reactions that are morphologically indistinguishable from the so-called accelerated reactions after insertion of potent vaccine. Reactions have been observed to range from a simple papule to one in which the papule is replaced by vesiculation and pustulation, surrounded by a zone of erythema.[2]

If kept consistently below the freezing point, vaccine lymph may be expected to maintain its potency unimpaired for at least six months. If the lymph is stored below 50 F (10 C) it should maintain its potency for at least 14 days. If, however, the lymph is kept at ordinary room temperature its potency cannot be assured for more than seven days. Vaccine lymph should be stored in the dark and exposure to any source of heat should be avoided. Dried smallpox vaccine should retain its potency for at least six months without refrigeration in temperate climates, or for at least one month at tropical temperatures. When opened, the vaccine should be used at once; any surplus should be discarded and not kept for subsequent use unless it can be kept in a refrigerator at a temperature below 10 C when the potency may be maintained for a week.[3]

Jenner himself recognized the immediate type of reaction and it has even been proposed that this immediate reaction be called the Jenner reaction.[4] This particular reaction is found in all persons who have an active immunity from a previous case of smallpox, a vaccinia, or a vaccinoid reaction. The reaction comes on about 12 hours after vaccination and it lasts for 48 to 72 hours. It consists of a macule or a papule—rarely a vesicle. In those highly allergic individuals in whom a vesicle occurs as an allergic reaction, its early appearance distinguishes it from a vaccinoid response. There is slight induration around the vaccination site caused by the inflammatory reaction of the body destroying the cowpox virus. If one rolls the vaccination site under the finger one gets a feeling of possibly a small pea being in the skin.

Vaccine failures in primary immunization of very young infants have been shown to be due to interference by placentally transmitted maternal antibodies. Repeat vaccination at the age of 8 or 10 months is indicated. Repeated failures in revaccination should lead to attempts at another site, such as the opposite arm, away from the area of the previous scar. When protection is imperative, revaccination on the flexor surface of the forearm usually will result in a vaccinoid reaction in almost anyone.

Revaccinations should be inspected at three days and again at seven days. Actual evidence of immunity cannot be determined unless the site of vaccination is reexamined.

---

[1] Waldo, H. H.: Smallpox Among "Vaccinated" Troops, U. S. Armed Forces M. J. 6:799-806 (June) 1955. Sivertson, S. E., and Hyman, J. B.: Smallpox: 22 Cases in United Nations Personnel, Korea, ibid. 3:1777-1785 (Dec.) 1952. Esposito, M. J., and Ziss, R. C.: Smallpox, ibid. 3:677-683 (May) 1952.

[2] Benenson, A. S.: Immediate (So-Called Immune) Reaction to Smallpox Vaccination, J. A. M. A. 143:1238-1240 (Aug. 5) 1950.

[3] Memorandum on Vaccination Against Smallpox, London, Her Majesty's Stationery Office, 1956.

[4] Gloyne, L. B.: Smallpox Vaccination Reactions, Correspondence, J. A. M. A. 122:395-396 (June 5) 1943.

ORGANIZATION SECTION

REVISION OF CATEGORIES IN A. M. A. DIRECTORY

In the 1958 American Medical Directory there appears for the first time an attempt to delineate the type of practice. Categories are provided for "General Practice," "Full-time Specialists," "Part-time Specialists," etc., through 12 categories.

Confusion has been caused by the category referred to on page 9 of the Directory as "Full-time Hospital Staff—T. O. P. 5 Paid house officers who assist in conducting the professional work of the hospital, directly relating to the care and management of patients." In several respects, this wording is unfortunate. Many physicians who should have been classified as "full-time specialists" or "full-time medical school" or under some other classification, have been listed under T. O. P. 5.

A revision has been sent to all the owners of the 1958 Directory, which substitutes the following paragraph for the present T. O. P. 5:

"FULL-TIME STAFF IN HOSPITALS—T. O. P. 5. Physicians full-time in hospitals, other than interns and residents; includes many physicians who also could be classified under other T. O. P. categories such as full-time specialists, medical school faculty personnel, research, etc."

SECTION MEETINGS, ATLANTIC CITY, JUNE 8-12, 1959

The various sections of the Scientific Assembly that met in the morning at the San Francisco meeting will meet in the afternoon at Atlantic City, and vice versa, except where joint meetings are held between two or more sections. In such instances an afternoon section may meet jointly with other sections in the morning or a morning section may meet in the afternoon. The schedule follows:

Morning
Wednesday, Thursday, Friday
June 10-12

Anesthesiology
Dermatology
Gastroenterology and Proctology
Internal Medicine
Obstetrics and Gynecology
Ophthalmology
Orthopedic Surgery
Pathology and Physiology
Preventive Medicine
Urology

Afternoon
Tuesday, Wednesday, Thursday
June 9-11

Diseases of the Chest
Experimental Medicine and Therapeutics
General Practice
Laryngology, Otology, and Rhinology
Military Medicine
Nervous and Mental Diseases
Pediatrics
Physical Medicine
Radiology
Surgery, General and Abdominal
Miscellaneous Topics

Prospective participants on section programs should correspond immediately with section secretaries, or with the Secretary, Council on Scientific Assembly, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

COUNCIL ON INDUSTRIAL HEALTH

A GUIDE FOR MEDICAL SERVICES FOR CONSTRUCTION PROJECTS

This guide has been prepared by the ad hoc *Committee on Medical Services for Construction Projects of the Council on Industrial Health, American Medical Association, the members of which are Drs. Irving R. Tabershaw, New York, and Joseph A. Quigley, Cincinnati.*

B. DIXON HOLLAND, M.D., *Secretary.*

The official policy statement of the American Medical Association entitled "Scope, Objectives, and Functions of Occupational Health Programs" and the Council on Industrial Health publication entitled "Guiding Principles of Medical Examinations in Industry" were developed *primarily* to guide the establishment and operation of occupational health services in "ordinary," static employment situations. These statements offer considerable help in the establishment and operation of occupational health services for construction projects and are recommended for such use insofar as practicable. Construction projects, however, differ sufficiently from ordinary industrial operations and pose sufficiently different occupational health problems as to require an additional special occupational health guide. This statement is intended to serve as such a guide.

The Need for Medical Services for Construction Projects

Many serious personal injuries occur on construction projects. Aside from the humane consideration of providing the best in medical care, the scope of medical services available may affect considerably the total cost of the project. As indicated by the manual rates for workmen's compensation insurance, insurance losses in the construction industry are among the highest. In concrete construction, for example, the rate in different states varies from $2 to $10 per hundred dollars of payroll, and the rate for structural steel erection varies from $5 to $25 per hundred dollars of payroll (according to Liberty Mutual Insurance Company, New York). When it is considered that approximately half of the monies expended on any project is for wages, it can be seen that insurance losses may appreciably affect the total cost. Generally, at least 2% to 2½% of the total cost of construction is for workmen's compensation premium, e. g., for a 10 million dollar project, the premium would vary between $200,000 and $250,000. Since premiums vary according to the contractor's previous experience, some with poorer records are charged as much as two to three times the normal manual rate.

In addition to the medical and indemnity losses, there are the intangible factors, such as loss of time in travel to physicians' offices and interference with construction schedules. Accident prevention is the basic approach to the control of these losses, and the establishment of a competent medical service not only assists in the prevention of accidents but can minimize their ultimate ill-effects in terms of the residual impairment of the injured worker and the monetary loss involved. Records of the medical department in accidental injury cases, if properly kept and utilized, can assist materially in the accident prevention program.

Furthermore, an efficient medical service favorably influences the workmen's compensation experience by reducing losses after the accident has occurred. This is accomplished in a number of ways: 1. The initial care of an injury is good, i. e., first aid is administered quickly and properly since facilities and trained personnel are immediately available. 2. Treatment on the premises may prevent serious complications, as minor injuries are more likely to be reported and treated if the worker is not subjected to lost time and inconvenience in travel. When the worker obtains good and prompt medical care, the period of disability is reduced to a minimum, with economic gain to both the worker and the employer. 3. Serious and complicated cases will be referred at an early date to a qualified specialist, with the elimination of the cost of an intermediate physician's services and the reduction of lost time and compensation.

Good placement examinations are strongly urged, and contracts which exclude them are to be discouraged. The state of health of crane operators and truck drivers, for example, concerns their fellow workers, and their examination for placement should be compulsory. It is not advisable to allow a man to attempt to do work which is inconsistent with his abilities. Opposition to the proper placement examinations seems to be presented only by those who either fear their misuse as a bar to employment or have a callous disregard for the rights and safety of their fellow workers.

In some states (for example, New York) the general contractor is held liable for conditions which he creates or permits to exist on his jobs. As a result, in a large number of instances, subrogation rights have been exercised by subcontractors or their carriers to recover under the general liability coverage of the general contractor. With a well-operated and accepted medical department it has been found that at the time the injured employee is first treated a complete story can be obtained, the site of the accident can be examined, witnesses secured, and the information developed so that the possibility of a liability-type of case is minimized.

An additional reason for providing medical service on construction projects is that they are likely to be located in isolated areas and may involve problems of medical care which are not ordinarily encountered in other industries. Good medical service is also of value from a public relations standpoint.

Basic Requirements and Guide to Their Fulfillment

The effectiveness of a medical program depends to a great extent on the advance planning and its coordination with the safety program. Experience has proved that efficient services are rarely developed after a construction project has started. The following points should be considered:

Number of Workers Employed.—The number of workers employed each month by shift and by craft should be estimated. Employment is likely to be low at the initiation of a project, rise to a peak for a varying period, and then gradually taper off. On many projects local craftsmen are not available in sufficient numbers and with the necessary skills. The contractor may in such instances have to provide on-site barracks. This involves problems in sanitation and medical care. The area from which the labor force is recruited should be determined, as it is not unusual for workers on construction projects to drive several hours to and from work. This complicates the problem of on-site follow-up of injury and off-site medical care. Although a large number of workers may be involved, there may be fewer cases needing medical attention at any one time because of dispersal and varying shifts.

Unusual Features of Project.—Unusual features of the construction project should be considered and dealt with. For example, road building operation may require the use of mobile medical equipment. The building of a bridge may involve special problems of transportation and location of medical facilities. Silicosis and caisson disease may be special occupational hazards. Excessive heat and noise also may be problems. The likelihood of the occurrence of snake bite, insect-borne diseases such as malaria, enteric diseases such as typhoid fever, and other water and food-borne diseases should be considered. Tetanus may be a problem. Climatic conditions may cause frostbite and also may damage roads enough to make hazardous the transportation of injured or ill workers. The availability of community facilities for use in catastrophe should be determined. If a disease such as influenza is likely to reach epidemic proportions in the area, and if local facilities to deal with this problem are inadequate, the company will, by default, have to use its own judgment as to immunizing its employees. The solution for such problems necessitates special preparations and special facilities.

In addition to the above considerations, the following requirements are basic and must be fulfilled.

Physician.—A qualified physician should be employed to direct all medical services at the job site. The location of hospitals and the type of services they are prepared to offer should be determined. To utilize the physician's full potential, it is advisable to engage him on a continuing basis. His functions are (*a*) supervising the medical department, (*b*) supervising the first-aid facilities and personnel, (*c*) supervising the treatment of all occupational injuries and illnesses, (*d*) advising management on all medical policies and problems, (*e*) supervising job sanitation, (*f*) assisting in the safety program, (*g*) conducting physical examinations of workers, and (*h*) promoting health education and applying principles of health maintenance. Additional responsibilities and duties occasionally may be necessary depending on local conditions. In isolated communities these may be extended to include the medical care of the families of workers.

Emergency Medical Services.—Medical staff and facilities required for the particular construction project should be provided. The following general guides are suggested: 1. When a small construction force (less than 300) is to be employed for a short period (not more than two months), individuals trained in first aid usually will be the only "medical" personnel necessary on the premises. A qualified first-aid attendant should be available for each shift, and adequate first-aid kits should be available. Workers should be instructed to report all injuries. The first-aid attendant should be under the direction of the responsible physician, and injured workmen should be sent to the physician's office or to the hospital after being given first aid.

2. When a somewhat larger construction force (300 or more) is employed for a longer period (two months or more) a professional nurse, registered in the state, should be in attendance full time in an adequate medical facility on the premises. In addition, the nurse should have some training in industrial nursing and first aid. A physician should be retained on a part-time basis to visit the premises at regular intervals, and while there carry out all treatments as indicated and practicable. The medical facility should have adequate equipment and supplies for outpatient treatment.

3. When a large construction force (more than 2,000) is employed, a full-time physician with appropriate nursing staff should be engaged. When more than one nurse is employed, one should be designated to supervise. A medical facility should be provided on the premises adequate to implement the medical program. Provisions should be made for short-term inpatient care. The facility should be located near the construction operations and have such utilities as hot and cold running water, sewage disposal, and electricity. If a plant is being constructed, and if it is to have eventually a complete medical facility, consideration should be given to the early completion of such facility so that it may be used during the construction phase.

Medical Records.—A confidential medical records system should be established to include (*a*) a daily log listing chronologically all patients visiting the medical facility for occupational and nonoccupational injuries and illnesses, (*b*) cumulative individual medical records, (*c*) adequate workmen's compensation records, and (*d*) periodic statistical analyses.

Insurance Coverage, and Compliance with State and Local Laws.—The type of insurance coverage and the nature of the services provided by the carrier, e. g., industrial hygiene, rehabilitative, should be determined. The physician should acquaint himself with the procedures that will facilitate the processing of claims. The number of subcontractors and the type of work each does and the type of insurance coverage each has should be ascertained. Applicable state and local requirements in regard to the provision of medical care under workmen's compensation should be ascertained and complied with.

Job Sanitation.—Special problems in sanitation exist on all construction sites. Provision must be made for safe and potable drinking water, sewage disposal, and sanitary eating facilities.

COUNCIL ON NATIONAL DEFENSE

RESULTS OF SURVEY OF PHYSICIANS SEPARATED FROM ACTIVE MILITARY SERVICE

This opinion survey of physicians separated from active military service has been conducted by the Council on National Defense since 1952. The questionnaire utilized in the survey is primarily designed to obtain pertinent data based on the physician's observations and opinions, while in the armed forces, concerning the utilization of physicians and the medical staffing conditions in the uniformed services.

Periodically, the results of this continuing survey are reported in The Journal. *The questionnaire also requests comments and suggestions as to ways to further improve the Medical Corps as well as ways and means whereby organized medicine can be of greater assistance to military physicians. Consequently, the results of the survey serve as a basis for recommendations and conferences with representatives of the military establishment.*

Frank W. Barton, *Secretary,*
Council on National Defense

This report covers the period from Jan. 1, 1957, to Dec. 31, 1957. During that period, the Council sent out 2,055 questionnaire forms and, of these, 1,167 completed ones were returned, representing a 56.8% response.

The age distribution of responding physicians in the Army, Navy, and Air Force is disclosed in table 1.

Number of Years Since Graduation

More than half of the physicians replying to the question on years since graduation were graduated from medical school in 1950 or subsequent to 1950; the second largest group graduated during the period 1945-1949. None failed to indicate the years of graduation from medical school. Table 2 discloses the complete tabulation.

Table 1.—*Age Distribution of Physicians by Five-Year Age Groups*

Age	Army	Navy	Air Force
25-29	73	115	275
30-34	119	116	225
35-39	78	33	52
40-44	29	12	14
45-49	13	1	3
50 and over	4	3	2
Total	316	280	571

Table 2.—*Number and Percentage Distribution of Physicians Graduated from Medical Schools in Selected Intervals*

Interval	No.	%
Before 1940	15	1.3
1940-1944	87	7.5
1945-1949	313	26.8
1950 and later	752	64.4
Total	1,167	100.0

Years of Residency Training

The largest group replying to the question on years of residency training had no residency training while the second largest group had but one year residency training at the time of entrance on active duty. A complete breakdown is given in table 3.

Occupation at Time of Entering Service

The largest group of physicians who served in the Army, Navy, and Air Force were in residency training at the time of entrance in military service.

Table 3.—*Percentage Distribution of Total Physicians by Years of Residency*

No. of Years	No.	%
None	408	35.0
1	258	22.1
2	154	13.2
3	182	15.6
4	110	9.4
5	40	3.4
6	15	1.3
Total	1,167	100.0

The second largest group in all three services were in specialty practice. Table 4 indicates the percentage distribution by services according to type of practice at time of entering military service. The summary report for the year 1956 reflected that the largest groups in the Army and Navy were engaged in general practice at time of entrance on active military duty, while the largest group in the Air Force was in internship.

Table 4.—*Percentage Distribution of Physicians According to Type of Practice at Time of Entering Military Service*

	Army, %	Navy, %	Air Force, %
Internship	5.7	11.8	11.4
Residency	33.2	45.4	45.7
General Practice	22.5	14.6	15.8
Specialty Practice	30.1	18.2	16.1
Other	8.5	10.0	11.0
Total	100.0	100.0	100.0

Number of Physicians Holding Board Certificate by Field of Specialization

Table 5 shows the detailed numbers, by specialty and branch of service, of physicians holding board certificates. Of the 209 physicians who have board certificates, 78 were in the Army, 42 were in the Navy, and 89 were in the Air Force. The specialties covered over 15 different fields, of which the largest were internal medicine (34) and surgery (34). The second largest was radiology, and the third largest was pediatrics. In the previous report for the year 1956 internal medicine was first followed by surgery and pediatrics. By branch of service, a total of 24.7% of those in the Army, 15.0% of those in the Navy, and 15.6% of those in the Air Force had board certificates.

TABLE 5.—*Number of Physicians Holding Board Certificates by Field of Specialization*

Field of Specialization	Army	Navy	Air Force
Pediatrics	7	4	11
Psychiatry and neurology	5	4	8
Orthopedic surgery	4	..	7
Dermatology and syphilology	2	..	2
Radiology	7	6	12
Urology	2	1	1
Obstetrics and gynecology	5	1	2
Internal medicine	13	7	14
Ophthalmology	4	3	7
Pathology	5	4	5
Otolaryngology	1	..	2
Surgery	15	7	12
Anesthesiology	3	3	4
Plastic surgery	..	1	1
Neurological surgery	3	..	..
Unspecified	2	1	1
Total	78	42	89

Government Medical Education Received

Of the 1,167 physicians responding, a total of 193 stated that they had received assistance from the government in their medical education. There were 974 who indicated they had received no government assistance. The largest single group receiving government assistance was under the Army Specialized Training Program. The next two largest groups were under the Navy V-12 Program and the GI Program.

TABLE 6.—*Percentage Distribution of Physicians by Type of Governmental Medical Education Received*

	Army, %	Navy, %	Air Force, %
Army Specialized Training Program	54.4	22.7	44.5
Navy V-12	14.7	43.2	12.4
GI Bill	11.8	13.6	18.5
ASTP and GI Bill	13.2	...	8.6
Navy V-12 and GI Bill	1.5	9.1	4.9
Other	4.4	11.4	11.1
Total	100.0	100.0	100.0

Table 6 shows the percentages by branch of service. Of the responding physicians, 78.5% of those who served in the Army, 84.3% of those in the Navy, and 85.8% of those in the Air Force received no government assistance.

Training Received While in Service

There were 600 of a total of 1,167 responding physicians who received military medical training while on active duty in the Army, Navy, and Air Force. The Medical Field Service School accounted for the largest number, with the School of Aviation Medicine the second largest group. Table 7 sets forth the numbers and percentage distribution of physicians by type of training received in each branch of service. The totals in this table exceed the total number of responding physicians because some physicians took more than one course.

TABLE 7.—*Number and Percentage Distribution of Physicians by Type of Governmental Medical Training Received*

	Army		Navy		Air Force	
Type of Training	No.	%	No.	%	No.	%
Basic course, medical field service school	283	85.0	9	3.1	93	15.9
Advanced courses, medical field service school	10	3.0	1	0.3	5	0.9
School of aviation medicine	6	1.8	28	9.6	168	28.8
Marine medical officers training	...	...	10	3.4	...	...
Marine field service training	...	...	8	2.7	...	...
Amphibious forces training school	1	0.3	15	5.1	...	...
Other schools	2	0.6	2	0.7	1	0.2
None of the above	31	9.3	220	75.1	316	54.2
Total	333	100.0	293	100.0	583	100.0

Physicians' Evaluation of Military Training

The majority of physicians filling out the questionnaire felt that all important features of military training had been satisfactorily covered. A small percentage indicated the training was unsatisfactory but gave no specific reasons. Others stated reasons why they considered their military training unsatisfactory. Table 8 shows, by branch of service, the percentages that were satisfied and unsatisfied and the percentage distribution of the causes of dissatisfaction.

Physicians' Evaluation of Assignment

The majority of responding physicians stated that their longest and next longest assignments were almost completely in line with their training and experience.

With respect to satisfaction with assignments, a greater proportion of the Air Force and Army physicians expressed satisfaction concerning their longest assignment than did the Navy physicians, while more in the latter group were satisfied with their next longest assignment than were the Army and Air Force physicians.

TABLE 8.—*Physicians' Evaluation of Military Training*

	Army, %	Navy, %	Air Force, %
Satisfactory	82.6	68.9	79.5
Unsatisfactory	17.4	31.1	20.5
Total	100.0	100.0	100.0
Unsatisfactory and insufficient training in			
Basic orientation and indoctrination	29.1	62.5	39.3
Military customs, administration, regulations, etc.	25.4	20.5	24.8
Military medicine and surgery	18.2	11.4	13.7
Miscellaneous	20.0	1.1	18.8
No answer	7.3	4.5	3.4
Total	100.0	100.0	100.0

However, a considerably greater proportion of Army physicians were very satisfied with their longest assignment than were Navy and Air Force physicians. A greater proportion of Army and Navy physicians were very satisfied with their next longest assignment than were Air Force physicians.

Tables 9 and 10 show the percentages by branch of service for physicians who responded to this question.

Types of Patients Treated

One of the questions was designed to determine the percentage of time devoted by physicians to military personnel, dependents of military personnel, and administrative duties, both at domestic and overseas stations. Table 11 sets forth the percentages for all branches of service.

TABLE 9.—*Relation of Assignments in the Service to Training and Experience*

Questions and Replies	Army, %	Navy, %	Air Force, %
Was longest assignment in line with training and experience?			
Almost completely	63.0	49.5	65.4
Partially, but satisfactorily	15.1	18.3	21.1
Partially, not satisfactorily	13.2	18.6	10.0
No, hardly at all	8.7	13.6	3.5
Total	100.0	100.0	100.0
Was next longest assignment in line with training and experience?			
Almost completely	52.3	56.8	51.0
Partially, but satisfactorily	14.7	18.9	27.4
Partially, not satisfactorily	13.2	9.5	10.6
No, hardly at all	19.8	14.8	11.0
Total	100.0	100.0	100.0

TABLE 10.—*Physicians' Satisfaction with Assignment*

Assignment and Response	Army, %	Navy, %	Air Force, %
Longest Assignment			
Very satisfied	52.1	35.7	44.6
Fairly satisfied	27.4	35.4	38.1
Dissatisfied	12.7	16.4	11.5
Very dissatisfied	7.8	12.5	5.8
Total	100.0	100.0	100.0
Next Longest Assignment			
Very satisfied	45.9	44.4	37.0
Fairly satisfied	27.6	34.5	38.3
Dissatisfied	14.8	12.3	12.8
Very dissatisfied	11.7	8.8	11.9
Total	100.0	100.0	100.0

Types of Nonmilitary Medical Care Provided

The question which was designed to determine the types of medical duties most frequently performed for nonmilitary persons elicited the information that in all three branches of the service outpatient care ranked first at domestic and overseas stations. In the Army, surgery ranked second at both domestic and overseas stations. In the Navy, pediatrics was second at domestic and overseas installations. General medical and hospital care was second for Air Force physicians both in the United States and at overseas bases. Table 12 sets forth the types of services rendered and with what frequency.

TABLE 11.—*Percentage of Time Spent in Treating Military Personnel, Dependents of Military Personnel, and Other Duties*

Persons Treated	75-100%	50-75%	About 50%	25-50%	Under 25%	No Response
Military personnel						
Domestic	15.6	10.4	15.7	12.9	20.1	25.3
Overseas	13.9	4.9	7.3	5.1	4.9	63.9
Dependents of military personnel						
Domestic	20.1	9.5	14.1	14.1	18.7	23.5
Overseas	5.1	2.2	5.8	6.4*	9.8	70.7
All other duties						
Domestic	8.8	0.8	2.2*	4.8	27.4	56.0
Overseas	1.5	0.7	1.5	3.4	13.8	79.1*

* Forced to total 100%.

Medical Care of Dependents of Military Personnel Which Could Have Been Adequately Performed by Civilian Medical Personnel

With respect to service in the United States, the majority of responding physicians were of the opinion that all medical care of nonmilitary persons could have been adequately performed by civilian medical personnel. In the three branches of the service, 582 of 930 physicians, or 63%, so responded. However, in regard to overseas service only 100 of 393 physicians, or 25%, were of that opinion. In fact, 140 of 393 physicians, or nearly 36%, stated that none of the medical care of nonmilitary persons at overseas stations could have been adequately performed by civilian medical personnel. Table 13 shows the percentages of physicians in the Army, Navy, and Air Force and their opinion in regard to the feasibility of the treatment of dependents of military personnel by civilian medical personnel at both domestic and overseas bases.

TABLE 12.—*Type of Service Provided to Dependents of Military Personnel*

Type of Service	Army, %	Navy, %	Air Force, %
Domestic			
Outpatient care	36.6	39.1	33.0
Surgery	14.8	9.6	12.2
General medical and hospital care	13.8	13.5	17.1
Obstetrics and gynecology	10.4	12.7	13.9
Pediatrics	12.1	15.3	15.7
Other	12.3	9.8	8.1
Total	100.0	100.0	100.0
Overseas			
Outpatient care	34.8	33.9	36.5
Surgery	13.7	11.3	11.6
General medical and hospital care	13.0	17.4	16.1
Obstetrics and gynecology	13.0	13.1*	12.2
Pediatrics	12.2	19.1	15.9
Other	13.3	5.2	7.7
Total	100.0	100.0	100.0

* Forced to total 100%.

TABLE 13.—*Physicians Indicating Feasibility of Medical Care of Nonmilitary Personnel by Civilian Medical Personnel*

Type of Service	Army		Navy		Air Force	
	No.	%	No.	%	No.	%
Domestic						
All care	119	56.1	166	65.9	297	63.7
Most care	47	22.2	49	19.4	110	23.6
Some care	37	17.5	32	12.7	48	10.3
None	9	4.2	5	2.0	11	2.4
Total	212	100.0	252	100.0	466	100.0
Overseas						
All care	30	21.1	25	36.8	45	24.6
Most care	22	15.5	10	14.7	24	13.1
Some care	43	30.3	10	14.7	44	24.0
None	47	33.1	23	33.8	70	38.3
Total	142	100.0	68	100.0	183	100.0

Physicians' Evaluation of Staffing Conditions

One of the questions was designed to obtain the opinion of physicians as to staffing conditions of nurses, enlisted medical personnel, physicians, dentists, and others in the two units where the physician served his longest and next longest assignments. With respect to the longest assignment, the tabulation of this multiple-answer question indicated that in the Army replies indicating overstaffing totaled 160, understaffing 339, and adequate staffing 690. In the Navy, overstaffing totaled 165, nderstaffing 239, and adequate staffing 615. The ir Force tabulation revealed 314 replies of overaffing, 749 of understaffing, and 1,157 of adquate affing.

The response to the question concerning the next ngest assignment revealed that in the Army overaffing totaled 78, understaffing 126, and adequate affing 429. In the Navy, the results were 84, 115, nd 407, respectively, while the Air Force tabulaon was 106, 205, and 510 respectively. Table 14 eflects, in detail, the percentages relative to overtaffing, understaffing, and adequate staffing conitions in the three military services for the hysicians' longest and next longest assignments.

ABLE 14.—*Medical Staffing Conditions in the Armed Forces*

	Nurses %	Enlisted Medical Personnel %	Physicians %	Dentists %	Others %	Total %
or longest assignment						
rmy						
Overstaffed	5.4	10.2	16.3	20.3	27.5	13.5
Understaffed	41.3	27.5	30.3	10.3	52.5	28.5
Adequate	53.3	62.3	53.4	69.4*	20.0	58 0
Total	100.0	100.0	100.0	100.0	100.0	100.0
avy						
Overstaffed	6.7*	14.1	28.2	12.4	35.7	16.2
Understaffed	29.3	24.3	22.0	17.5	42.9	23.5
Adequate	64.0	61.6	49.8	70.1	21.4	60.3*
Total	100.0	100.0	100.0	100.0	100.0	100.0
Air Force						
Overstaffed	6.9	10.2	13.8	25.1	27.3	14.2*
Understaffed	40.5	36.6	41.6	11.9	60.0	33.7
Adequate	52.6	53.2	44.6	63.0	12.7	52.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
For next longest assignment						
Army						
Overstaffed	4.8	10.8	18.2	14.2	23.0	12.3
Understaffed	25.8	18.7	19.4	13.5	38.5	19.8
Adequate	69.4	70.5	62.4	72.3	38.5	67.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Navy						
Overstaffed	7.9	14.5	21.2	8.4	50.0	13.9
Understaffed	20.2	20.0	19.4	15.3	33.3	19.0
Adequate	71.9	65.5	59.4	76.3	16.7	67.1*
Total	100.0	100.0	100.0	100.0	100.0	100.0
Air Force						
Overstaffed	7.8	12.2	13.1	18.6	28.6	12.9
Understaffed	29.4	22.1	31.3	14.7*	57.1	25.0
Adequate	62.8*	65.7	55.6	66.7	14.3	62.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

* Forced to total 100%.

Unnecessary or Wasted Aspects of Military Training

There were 334 physicians who responded affirmatively to the question, "Were there any aspects of your military training that were unnecessary or wasted?" Negative answers were received from 833 medical officers. With respect to the affirmative replies, the most frequently mentioned area of waste was the performance of nonmedical duties. Table 15 shows the responses to this question by branch of service.

Physicians' Suggestions for Making Military Service More Attractive to Medical Men

There were 1,051 physicians who offered suggestions for making military service more attractive for physicians. Only 110 physicians felt that nothing could be done to make military service more attractive to medical men.

In the 1956 survey the number one suggestion was a recommended improvement in the utilization of medical personnel while the 1957 survey reveals a recommended increase in pay as the most frequent suggestion for making military service more attractive to medical men. The 1956 number one suggestion as well as a recommendation of adequate family housing did not appear as one of the top 10 suggestions in the results of the 1957 survey. Table 16 sets forth the suggestions from physicians in the three branches of military service.

TABLE 15.—*Unnecessary or Wasted Aspects of Military Training*

	Army		Navy		Air Force	
	No.	%	No.	%	No.	%
Not in field for which trained	15	14.5*	9	12.7	17	10.6
No training or experience in field	3	2.9	3	4.2	3	1.9
Capable of more responsible medical duties	8	7.8	12	16.9	10	6.2
Nonmedical duties	31	30.1	16	22.5	67	41.9
Miscellaneous	36	35.0	26	36.6	48	30.0
No reason given	10	9.7	5	7.1*	15	9.4
Total	103	100.0	71	100.0	160	100.0

* Forced to total 100%.

Suggestions for Improvement of Services Furnished by Medical Associations to Military Physicians

A total of 397 physicians, or 34%, offered suggestions in response to the question concerning the role of national and local medical associations in maintaining closer contact or rendering better service to their members who served as physicians in the armed forces. Some physicians offered more than one suggestion. The multiple suggestions are tabulated in table 17. The other 770 physicians who returned the questionnaire offered no suggestions.

TABLE 16.—*Physicians' Suggestions for Making Military Service More Attractive to Medical Men*

	Army		Navy		Air Force	
	No.	%	No.	%	No.	%
Increase in pay	110	12.9	83	10.8	214	12.8
Choice of stable location	75	8.8	74	9.6	123	7.4
More capable commanding officers	65	7.6	42	5.5	115	6.9
Less administrative nonmedical duties	66	7.8*	50	6.5	98	5.9
Independent medical service without rank	65	7.6	49	6.4	89	5.3
Higher rank; merit promotions	47	5.5	45	5.8*	108	6.5
Freedom from nonmilitary interference	57	6.7	37	4.8	101	6.0
Residency or further training	37	4.3	39	5.1	97	5.8
Duties in line with training and experience	44	5.2	50	6.5	78	4.7
Opportunity to practice specialty	35	4.1	43	5.6	87	5.2
Other	251	29.5	257	33.4	563	33.5*
Total	852	100.0	769	100.0	1,673	100.0

* Forced to total 100%.

Physicians Who Would Voluntarily Remain in Service

In response to the question relative to military service beyond the obligatory tour of duty, 675 physicians indicated they would not be willing to stay in military service for more than two years of service under any conditions except total war. There were 492 physicians who indicated they would serve an additional period under certain conditions. Some physicians listed more than one condition. Table 18 reflects the reasons or conditions under which an additional period of service would be acceptable.

TABLE 17.—*Suggestions for Improvement of Services Furnished by Medical Associations to Military Physicians*

Suggested Society Activities	Army	Navy	Air Force
More information, newsletters, etc.	29	8	36
Personal visits by civilian physicians to evaluate grievances	45	23	66
Invitation of military physicians to civilian medical meetings	23	29	55
Assistance in locating a position after discharge	7	4	6
Assistance in preventing evasion of military service	3	2	2
Distribution of questionnaire to physicians in service	19	5	30
Provision of specialists for clinical conferences	5	4	14
Miscellaneous suggestions	24	19	34
Total	155	94	243

TABLE 18.—*Distribution Indicating Conditions of Voluntary Extension of Service Beyond Two-Year Requirement*

Conditions	Army No.	Army %	Navy No.	Navy %	Air Force No.	Air Force %
Demonstrated need	6	3.3*	13	7.8	13	3.6
All doctors serving on an equitable basis	8	4.5	6	3.6	19	5.2
Promotion to higher rank	11	6.1	4	2.4	28	7.6
Increase in pay	30	16.8	23	13.9	64	17.5
Given residency or further training	12	6.7	25	15.1	38	10.4
Opportunity to practice specialty	20	11.2	17	10.2	35	9.6
Choice of duty assignment	15	8.4	16	9.6	44	12.0
Choice of stable location	34	19.0	25	15.1	43	11.7
Living quarters for family	9	5.0	5	3.0	18	4.9
Request for extension of status quo refused	1	0.6	2	1.2	...	...
Extended service time voluntary	6	3.3*	7	4.2	12	3.3
Miscellaneous conditions	27	15.1	23	13.9	52	14.2
Total	179	100.0	166	100.0	366	100.0

---

* Forced to total 100%.

Preferred Branch of Service for Practice of Medicine

In response to the question of preference if the physician were going to practice medicine in a federal government agency, 453 physicians stated a preference for the armed forces. A total of 436 physicians expressed a preference for other agencies of the federal government, 248 had no preference, and 30 did not answer. Of those who preferred the armed forces, the majority chose the branch of service in which they had served. Table 19 sets forth the preferences as to branch of service.

TABLE 19.—*Preferred Branch of Service for Practice of Medicine*

	Army No.	Army %	Navy No.	Navy %	Air Force No.	Air Force %
Army	84	72.4	1	0.9	7	3.2
Navy	4	3.4	104	89.6	5	2.3
Air Force	21	18.1	9	7.8	206	93.2
No preference	6	5.2	2	1.7	2	0.9
No answer as to branch of service	1	0.9	...	...	1	0.4*
Total	116	100.0	116	100.0	221	100.0

---

* Forced to total 100%.

Distribution of Physicians by Rank at Time of Discharge

The majority of physicians in the Army and Ai Force held the rank of captain at the time of th release from active military duty, while those sep rated from the Navy held the equivalent rank lieutenant, senior grade. There were 1,102 phy cians who answered this question. The survey in cated that approximately 2% of those who ported were in the lowest rank, while 85% held rank of captain or lieutenant, senior grade. Th were approximately 13% with the rank of major lieutenant commander and higher. Table 20 in cates the number and percentages by rank wit the three services.

TABLE 20.—*Distribution of Physicians by Rank at Time of Discharge*

	Army No.	Army %	Navy No.	Navy %	Air Force No.	Air Force %
1st. lt.-lt. j. g.	3	1.0	19	7.2	...	...
Capt.-lt. s. g.	223	74.6	200	75.8	511	[illegible]
Major-lt. commander	67	22.4	28	10.6	23	[illegible]
Lt. col.-commander	5	1.7	14	5.3	[illegible]	[illegible]
Col.-capt.	1	0.3	3	1.1	...	...
Total	299	100.0	264	100.0	539	[illegible]

---

* Forced to total 100%.

Reserve Status

Of the 1,167 physicians reporting, 193 indicat they retained their reserve commissions while 9 resigned their commissions. There were two wl did not respond. By services, the Army had retaining commissions and 247 resigning; the Na had 44 retaining and 236 resigning; and the Force had 81 retaining and 489 resigning th commissions. Table 21 reflects the percentages branch of service.

Length of Active Service as a Medical Officer

In the Army 308 responding physicians serv an average (median) of 23 months in the Unit States and 152 responding physicians served an average (median) of 21 months at overseas stations. There were 279 naval medical officers who had an average (median) of 24 months active duty in the United States and 108 naval medical officers had an average (median) of 12 months overseas. Responses from 545 physicians in the Air Force revealed an average (median) tour of duty of 24 months in the United States, and 194 physicians in the Air Force had an average (median) tour of duty of 22 months at overseas bases.

TABLE 21.—*Percentage Distribution of Physicians Accordin to Reserve Status*

	Army, %	Navy, %	Air Force,
Retained commission	21.5	15.7	14.2
Resigned commission	78.2	84.3	85.6
No response	0.3	...	0.2
Total	100.0	100.0	100.0

MEDICAL NEWS

CALIFORNIA

Dr. Freeman Comes to California.—Dr. Gustave Freeman, medical researcher, has joined the biological sciences department at Stanford Research Institute as program director of medical research. He will direct preclinical cancer research at the institute and clinical studies conducted with neighboring hospitals. Concurrently with his assignment, Dr. Freeman will conduct an advanced program on nucleic acids with Prof. George W. Beadle, recently named to share the 1958 Nobel prize in medicine, at California Institute of Technology. Dr. Freeman comes to Stanford Research Institute from the Cancer Chemotherapy National Service Center at Bethesda, Md., where he was head of the clinical pharmacology and therapeutics section. In addition, he was a consultant-in-biology for the Children's Hospital in Boston; a member of the Johns Hopkins Hospital medical staff; and an assistant professor of medicine, Johns Hopkins University School of Medicine, Baltimore.

COLORADO

State Medical Election.—The Colorado State Medical Society has installed the following officers: president, Dr. John Zarit, Denver; president-elect, Dr. John L. McDonald, Colorado Springs; vice-president, Dr. Robert P. Harvey, Denver; treasurer, Dr. William C. Service, Colorado Springs; and constitutional secretary, Dr. Harry C. Hughes, Denver.

DELAWARE

Centers for Retarded Children.—Delaware reportedly has opened the first state-supported day care center for severely mentally retarded children in the U. S. Only the most helpless of the mentally retarded are accepted for care—from 9 to 5 five days a week. The purpose is twofold: to try to train the children in the basic phases of self-care; to relieve their parents of the constant strain of taking care of them at home. This is the first of a series of centers to be set up throughout Delaware under the jurisdiction of Dr. Mesrop A. Tarumianz, state mental health director.

ILLINOIS

Request for Old Pictures of Autos.—The Illinois State Medical Society is preparing an exhibit centered around an *Illinois Medical Journal* article which told of the role of physicians in the development of the automobile in the U. S. at the turn of the century. To help illustrate this exhibit, the society will appreciate the loan of old photographs showing physicians at the wheels of cars of 1900-1910 vintage. Scenes showing difficulties on the road, or poor highway conditions, are especially desired. Enlargements will be made of these photographs and the originals returned undamaged. Photographs should be accompanied by a memo giving the name and town of the physician, whether living or deceased, and the make and year of the automobile. They should be sent to Mr. John A. Mirt, Illinois State Medical Society, 185 N. Wabash Ave., Chicago 1.

Chicago

New Department of Experimental Surgery.—Michael Reese Hospital and Medical Center has announced the appointment of Dr. William C. Shoemaker as head of its new department of experimental surgery which will begin operations Jan. 1, 1959. Dr. Shoemaker at present is an assistant in surgery at the Peter Bent Brigham Hospital, Boston, and a research fellow at Harvard Medical School. At Michael Reese he will continue his research on the metabolism of the liver in surgical conditions, and other work of the newly formed department will concern the role of the autonomic nervous system in various surgical problems and the reconstruction of intraperitoneal smooth muscle organs. Dr. Shoemaker, a native of Chicago, received his M.D. degree from the University of California, San Francisco, in 1946 and served 38 months with the U. S. Navy Medical Corps.

MAINE

Dr. Hill Receives Huddilston Medal.—Dr. Frederick T. Hill, Waterville, medical director of Thayer Hospital, was honored recently by the Maine Tuberculosis Association which awarded to him its Roselle W. Huddilston Medal "for distinguished service and outstanding contributions in the field of health to the people of the State of Maine." The Huddilston Medal established in Maine to honor health leaders and recognize their work, is named for Mrs. John Homer Huddilston of Orono, a volunteer health worker and leader in the state for more than 40 years. It is given "in recognition of contributions within the total field of health which is in keeping with the tuberculosis association's concept that it should be interested in all aspects of health improvement, for all are important and

---

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

they all contribute to tuberculosis control." The medal is not limited to physicians and is primarily awarded in recognition of services rendered beyond the call of a person's ordinarily defined responsibilities and duties. The medal was presented to Dr. Hill at the annual meeting of the Maine Tuberculosis Association by Dr. Thomas A. Foster, Portland, chairman of the Huddilston Medal Committee. A citation, describing Dr. Hill's accomplishments, listed service as president of the Maine Medical Association (1936-1937), the Maine Hospital Association (1944-1946), and the New England Hospital Assembly (1954).

MASSACHUSETTS

State General Practitioner of the Year.—The Executive Committee of the Massachusetts Medical Society has named Dr. Kathleyne S. Snow as the society's "General Practitioner of the Year" and its nomination for the A. M. A. national award. Dr. Snow is the first woman physician to receive the Massachusetts honor. After her graduation from Tufts College Medical School in 1923, Dr. Snow set up practice in Jamaica Plain, where she continues to practice. In presenting her nomination to the Executive Committee her fellow physicians of the Norfolk District stated, in part, "A credit not only to the women in medicine, but to the whole medical profession, Dr. Snow richly deserves the honor of being selected as the Massachusetts General Practitioner for 1958."

MICHIGAN

Lecture on Schizophrenia.—Dr. Marvin L. Adland, clinical director of Chestnut Lodge Sanitarium, Rockville, Md., will give a lecture on the treatment of schizophrenia at the Haven Sanitarium, Rochester, Mich., Dec. 13.

Dr. Krystal Receives Research Award.—The Michigan Society of Neurology and Psychiatry on Oct. 23 presented its research award to Dr. Henry Krystal, an associate member of the society. This award, consisting of a prize of $250 and an appropriate scroll, is presented annually "for meritorious original work in neuropsychiatry done by men in the first five years of training or experience." Dr. Krystal's paper was entitled "Physiological Treatment of Delirium Tremens," and has been accepted for publication in the *Journal of the American Psychiatric Association.*

MINNESOTA

Institute on Perinatal Casualties.—The University of Michigan School of Public Health and the University of Minnesota School of Public Health will jointly hold an "Institute on Perinatal Casualties" Dec. 8-12 in Minneapolis, financed by a grant from the U. S. Children's Bureau. The program will be a series of seminars and discussions. Faculty case finding, care, and follow-up; perinatal mortality studies; care of the premature infant; etc. For informati write Dr. Donald C. Smith, associate professor o maternal and child health, University of Michiga School of Public Health, Ann Arbor, Mich., o Dr. Helen M. Wallace, professor of maternal and child health, University of Minnesota School of Public Health, Minneapolis, Minn.

NEBRASKA

Select Committee on Research.—Dr. Charles M Wilhelmj, professor of physiology, has been named chairman of an all-University Committee on Research at Creighton University School of Medicine, Omaha. This committee was selected by the Academic Senate, composed of deans of the various schools and colleges under the chairmanship of the academic vice-president, the Rev. William F. Kelley, S.J. The newly-named group will act as a clearing house for research in the university and as university agent in general research grants. Further, the Committee on Research will encourage, advertise, initiate, and approve research in the several colleges. It will serve as liaison body with the Jesuit Research Council of America.

NEVADA

State Medical Election.—The following officers of the Nevada State Medical Association have been elected for 1958-1959: Dr. Roland W. Stahr, president; Dr. Ernest W. Mack, president-elect; Dr. William A. O'Brien, III, secretary-treasurer; Dr. Wesley W. Hall, A. M. A. Delegate; and Dr. Earl N. Hillstrom, A. M. A. Alternate Delegate, all of Reno.

NEW MEXICO

Dr. Lovelace to Speak at Holloman.—Dr. William R. Lovelace, II, will fly to Holloman Air Force Base as guest of honor for the Dec. 9 dinner meeting of the Holloman Section, American Rocket Society. Dr. Lovelace will explore various aspects of human factor research related to the hazard encountered by "Man in Space." Formerly chief o the Aero Medical Laboratory at Wright Air Development Center, Dr. Lovelace is now an official o the Lovelace Foundation. He has also served a chairman of the Aeromedical Panel of the USA Scientific Advisory Board and is now a member o the NATO Advisory Group for Aeronautical Research and Development (AGARD) under D Theodore von Karman.

NEW YORK

Lectures on Psychiatric Care.—A series of six lectures on practical aspects of psychiatric care in th community is being presented to North Country area physicians by Drs. Warren A. Mann and David B. Robinson, both assistant professors of psychiatry. The lectures, which started Oct. 28, will end Dec. 11 and are being held at Mercy Hospital, Watertown. Presented at the request of the Jefferson

County Academy of General Practice and designed to provide information helpful in psychiatric problems encountered in the general practice of medicine, the lectures are concerned with development of psychosocial problems, diagnosis, immediate treatment, legal considerations, and community resources and responsibilities that may be developed. Sponsoring the lectures are the New York State Medical Society, the Jefferson County Medical Society, the Jefferson County Mental Health Association, and the academies of general practice of the four participating counties. Sessions are held from 7:30 to 9:30 p. m.

New York City

Annual Wechsler Lecture.—The annual Israel S. Wechsler Lecture will be given Dec. 12, 8:30 p. m., in the Blumenthal Auditorium of the Mount Sinai Hospital. Charles M. Pomerat, Ph.D., professor of cytology, University of Texas, Galveston, will speak on "Recent Advances in the Study of Living Nerve Tissue."

Centennial Exhibit for Dr. Koplik.—In celebration of the 100th anniversary of the birth of Dr. Henry Koplik (1858-1927) "one of New York City's pre-eminent physicians," an exhibition bearing upon the life and achievements of Dr. Koplik will be placed on view in The New York Academy of Medicine. Dr. Koplik was a specialist in the diseases of children, was an eminent exponent of preventive medicine, and is most widely known as the discoverer of the "Koplik's Spots." He was the founder of the first "Milk Depot," making milk available to the poor and the underprivileged free or at a minimum cost. Dr. Koplik served as medical director of the Good Samaritan Dispensary, and was one of the founders of the American Pediatric Society and at one time was its president. The exhibit at The New York Academy of Medicine, organized by Dr. Murray H. Bass and Dr. Jerome L. Kohn, will be on view at The New York Academy of Medicine, first floor lobby, until the end of December. The public is invited. Admission is free.

OHIO

Annual Meeting on Internal Medicine.—The annual meeting of the Ohio Society of Internal Medicine will be held Jan. 21, 8 p. m., at the Netherland Hilton Hotel, Cincinnati. The presiding officers will be Dr. Arnoldus Goudsmit, Youngstown, president; Dr. George J. Hamwi, Columbus, vice-president; and Dr. Leonard P. Caccamo, Youngstown, secretary-treasurer. The meeting will be devoted to a review of the progress made by the society in the interest of patient care requiring the specialty of internal medicine in the State of Ohio during the year 1958. Dr. A. Carlton Ernstene, governor of the college for Ohio, has invited the Ohio Society of Internal Medicine to take part in the program of the Ohio Regional Meeting of the American College of Physicians to be held Jan. 22 at the Veterans Administration Hospital in Cincinnati. The program will include the presentation of a panel dealing with "Status of the Internist in Medical Care Plans," moderated by Dr. Hamwi, head, division of endocrinology and metabolism, Ohio State University College of Medicine. The panel will consist of four members: Dr. William B. Walsh, chairman, Legislative Committee of the American Society of Internal Medicine, Washington, D. C.; Dr. John J. Grady, chairman, Committee on Insurance Plans, Cleveland Society of Internal Medicine, Cleveland; Mr. Charles H. Coghlan, executive vice-president, Ohio Medical Indemnity, Inc., Columbus; Dr. Paul I. Robinson, coordinator of medical relations, Metropolitan Life Insurance Company, representing the Health Insurance Council, New York City.

OREGON

Grant for Research Building.—A grant of $1,297,955 from the National Advisory Council of the National Institutes of Health for construction of the University of Oregon Medical School's proposed Medical Research Building was approved in late September, paving the way for a request by the Board of Higher Education for matching funds from the 1959 Oregon State Legislature. Preliminary plans for the research structure were approved by the Higher Education Board in June. The building will be rectangular, 57 by 182 feet. It will be nine stories high including two stories below ground, with a total floor area of about 106,902 square feet, and designed so that five additional stories can be added at some future date. The building will be located north of the Medical Science Building. It will be constructed of reinforced concrete with exterior finish to be of glass and panel construction. Interconnection between the new and existing facilities will be provided. Provisions are incorporated in the plans for storage and processing of radioisotopic materials and for radioactive materials laboratories. Animal quarters are planned in the two sub-grade levels.

PENNSYLVANIA

Philadelphia

Symposium on Hypertension.—The Hahnemann Medical College and Hospital will present a Symposium on Hypertension at the Town Hall, Philadelphia, Dec. 8-12, under the following section headings: Pathology and Clinical Aspects of Hypertension, Basic Concepts of the Etiology of Hypertension, Pharmacology of Hypertension and Use of Sympathetic Blocking Agents, and The Role of Salt and Diuretics in the Therapy of Hypertension. The latter part of the symposium concerns medical and surgical treatment. On the third and fourth day, the clinical pharmacodynamics and therapeutic use of drugs will be considered. Panel discussions scheduled for Dec. 12 will have the following titles and moderators:

Development of an Effective Therapeutic Program, Dr. John H. Moyer.
Effect of Therapy on Prognosis in Patients with Hypertension, Dr. Charles C. Wolferth Sr.
Surgical Approach to Essential Hypertension, Dr. John M. Howard.

Participants in the symposium include Dr. William D. M. Paton, professor of pharmacology, Royal College of Surgeons of England, London, who will present "The Rationality or Irrationality of Ganglionic Blocking Agents in Hypertension," and Dr. Mordochai Toor, head, third medical department and cardiopulmonary laboratory, Beilinson Hospital, Kupat-Holim, Petah-Tikva, Israel, who will speak on "The Effect of Increased Intrapulmonary, Intracardiac, and Intra-arterial Blood Pressure on Sodium Excretion."

University Center for Radiology.—The William H. Donner Center for Radiology of the University of Pennsylvania received a $150,000 endowment gift from The Donner Foundation when the one-million-dollar center was dedicated earlier this year. The gift for endowment was in addition to the foundation's earlier contribution of $600,000 toward construction of the center. The foundation also donated a 2-million-volt x-ray machine. The center, located adjacent to the Hospital of the University of Pennsylvania, was named for William H. Donner, Pennsylvania industrialist and philanthropist, in recognition of his long interest in radiological diagnosis and treatment. It was constructed at a cost of $847,000, plus $184,000 for equipment. The Fels Fund contributed $25,000 for a radiobiology research program, and the U. S. Public Health Service provided more than $284,000 in grants for equipment and construction. The center consists of three floors, providing 16,000 square feet of floor space, and is connected with the present department of radiology at the hospital. The basement level contains electronic and precision machine shops and an auditorium seating 68 persons. Patient care is centered on the main floor, and the second floor will serve as the experimental and service floor.

The William H. Donner Center for Radiology of the University of Pennsylvania, Philadelphia.

UTAH

University of Utah Medical Center Planned.—In 1957, the State Legislature authorized construction of a unified medical center on the University of Utah campus, Salt Lake City, and made an initial appropriation of funds for planning and construction. This new plant will bring together under one roof the many activities of the College of Medicine and Nursing now housed in widely scattered temporary buildings. Work has already gone into preliminary plans for the new structure, including individual and team visits to other medical centers of the country, visits to Salt Lake City of various expert consultants, full-time services of a "space analyst" experienced in medical center planning, etc. Faculty committees and architects are now working jointly on "preliminaries." At an estimated cost of 10 million dollars for construction and 2 or 3 million for utilities, landscaping and equipment, this reportedly will be one of the smallest and least costly of university medical centers in the U. S. About two-thirds of the funds needed for the project are in hand or in prospect. A public campaign is now being initiated to raise the remainder.

WEST VIRGINIA

General Practice Meeting in Charleston.—The 10th anniversary of the West Virginia Chapter of the American Academy of General Practice will be observed at a meeting at the Daniel Boone Hotel in Charleston Dec. 7 with a special scientific assembly. A film, "Building For Tomorrow," will be shown during the period from 9:30 to 10 a. m., after which the following program will be presented, with a luncheon at noon:

10 a.m.—Pre- and Post-Partum Gynecological Problems, Dr. John H. Holzaepfel, assistant professor, department of obstetrics and gynecology, Ohio State University College of Medicine, Columbus.
11 a.m.—An Appraisal of Present Therapy for Peptic Ulcer, Dr. Charles M. Caravati, associate professor of clinical medicine, Medical College of Virginia, Richmond.
2 p.m.—Acute Chest Surgery, Hiatal Hernia, and Open Heart Surgery, Dr. Donald B. Effler, department of chest surgery, Cleveland Clinic, Cleveland.
3 p.m.—Respiratory Infections—A General Review of Diagnosis and Modern Treatment, Dr. William Curtis Adams, assistant professor of child health, department of pediatrics, University of Louisville School of Medicine, Kentucky.

Members of the American Academy of General Practice will be granted 4½ hours category one credit for attendance at the meeting. There will be no registration fee.

WISCONSIN

Academy Meeting in Milwaukee.—On Dec. 16-20 the Milwaukee Academy of Medicine will present a series of conferences, clinics, and ward rounds to be directed by Dr. Arnold S. Relman, associate professor of medicine, Boston University School of Medicine, and physician in charge of the Renal and Metabolic Clinic at the Robert D. Evans Memorial Hospital, Boston, concerning "Electrolyte Problems and Renal Disease" and also fluid and electrolyte problems as encountered in other fields of medicine. All sessions are open to interested physicians without registration fee.

Dec. 16—University Club of Milwaukee, Cocktails and Dinner, 6:00 p.m., *scientific session,* 8:00 p.m.
Clinics and Rounds: 9:00 a.m. to 12 Noon.
Dec. 17—Milwaukee County General Hospital.
Dec. 18—Veterans Administration Hospital, Wood.
Dec. 19—Milwaukee Children's Hospital.
Dec. 20—Milwaukee County General Hospital.

For information write the Milwaukee Academy of Medicine, 561 N. 15th St., Milwaukee.

GENERAL

Retarded Child Programs Expand.—The Oct. 11 *Science News Letter* reports that efforts to understand the causes of and care for the mentally retarded child have mushroomed from four state programs three years ago to 44 such programs today. In 1955, four states were pioneering in the mental retardation problem. These states were receiving only $141,000 in special project money advanced by the Children's Bureau of the U. S. Department of Health, Education and Welfare, Mrs. Katherine B. Oettinger, chief of the bureau, said. In 1956, the federal government ear-marked one million dollars annually for state mental retardation projects. A major goal of the fund was to close the gap between early detection and treatment of mental retardation in preschool children. Several of the state programs that are supported by federal funds are training future physicians in the diagnosis and treatment of various forms of mental retardation. Some of the state projects are located in university medical centers. Some, as in Minnesota, Maine, Georgia, and Idaho, are concentrated in rural counties in an effort to determine both the need for services and the available resources that can be developed. In Florida, Colorado, Alaska, and Massachusetts the emphasis is on how to integrate mental retardation programs into the services of local health departments. Most of the children seen in these projects are of preschool age. Determination of the nature and degree of mental retardation, and the causes, is the first point of assistance. Consideration is given to physical conditions that, if improved, would lessen the handicap. The family situation affecting the child's condition is carefully studied, and resources in the community to aid the child are sifted.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Nov. 8, 1958		Nov. 9, 1957 Total
	Paralytic Type	Total Cases	
New England States			
Maine	..	..	1
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	..	..	..
Middle Atlantic States			
New York	3	6	3
New Jersey	2	4	..
Pennsylvania	5	5	1
East North Central States			
Ohio	4	14	7
Indiana	3	4	5
Illinois	4	10	3
Michigan	12	31	7
Wisconsin	3	3	1
West North Central States			
Minnesota	1	1	..
Iowa	1	2	1
Missouri	7	7	1
North Dakota	1	1	..
South Dakota	..	4	..
Nebraska	..	..	..
Kansas	..	..	..
South Atlantic States			
Delaware	1	1	..
Maryland	..	..	..
District of Columbia	..	..	..
Virginia	3	3	..
West Virginia	3	3	..
North Carolina	2	2	..
South Carolina	1	2	1
Georgia	..	..	2
Florida	..	3	1
East South Central States			
Kentucky	2	2	4
Tennessee	4	5	2
Alabama	4	5	3
Mississippi	1	8	..
West South Central States			
Arkansas	1	1	..
Louisiana	..	..	5
Oklahoma	2	2	1
Texas	5	10	5
Mountain States			
Montana	..	..	..
Idaho	..	..	..
Wyoming	..	..	..
Colorado	1	1	1
New Mexico	..	1	..
Arizona	1	1	1
Utah	..	..	1
Nevada	..	..	..
Pacific States			
Washington	..	..	3
Oregon	..	..	1
California	19	21	10
Alaska	..	..	..
Hawaii	..	..	..
Puerto Rico	1	1	2
Total	97	159	73

Poliomyelitis Morbidity Trends.—According to the Poliomyelitis Surveillance Report of the Communicable Disease Center, Atlanta, Ga., for Oct. 31, during the 43rd week ending Oct. 25, 253 new cases (155 paralytic) were reported to the National Office of Vital Statistics. This represents a decrease in the total, but an increase in the paralytic cases. The previous week 289 cases were reported of which 140 were paralytic. Late seasonal rises in polio are not uncommon, the report stated, but the persistence of cases at this level, this long after the peak during the 38th week, is unusual. For the first time this year, paralytic cases exceeded the number for the corresponding week in 1956. During the 43rd week in 1956, 320 cases with 140 paralytic were reported. Aside from the concentration of cases in Michigan (total 57—paralytic 20), paralytic cases are distributed widely throughout the nation.

CANADA

Research Institute in Saskatoon.—The Saskatchewan Cancer and Medical Research Institute was formally opened May 10. The Institute has been built on the campus of the University of Saskatchewan College of Medicine, Saskatoon, through funds supplied by the Saskatchewan Division of the Canadian Cancer Society and the Government of Saskatchewan. It is connected by tunnel with the Medical Building and the University Hospital and will provide housing for the Saskatchewan Research Unit of the National Cancer Institute of Canada as well as a radiation physics group and a tissue culture suite occupied by the department of anatomy and bacteriology of the University of Saskatchewan. The lower floor will provide laboratory space for the clinical departments of anaesthesia, medicine, pediatrics, neurosurgery, and surgery.

CORRECTION

Psychoanalysis Meeting Dec. 6-7.—In the Nov. 15 issue of The Journal, p. 1562, the mid-winter meeting of the Academy of Psychoanalysis was reported to have been held Nov. 6-7. Dr. Jules H. Masserman, past-president, who was given as president, has written that the academy "will hold its midwinter meeting at the Roosevelt Hotel, New York City, Dec. 6-7, under the presidency of Dr. William V. Silverberg, of New York."

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Oral.* Phoenix, April 5-10. All applications already on file. Sec., Dr. Forrest E. Leffingwell, 217 Farmington Ave., Hartford 5, Conn.

American Board of Dermatology: *Written.* Several Cities, Oct. 5. *Oral.* Oklahoma City, Jan. 15-18, 1960. Sec., Dr. Beatrice M. Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *1959 Schedule—Written,* Oct. 19. Final date for filing application is May 1. *Oral.* For candidates in the South and Southwest, New Orleans, Feb. 3-6. Final date for filing application is Jan. 1. *Oral.* For candidates in the Midwest. Chicago, April 15-18. Final date for filing application is Jan. 1. *Oral.* For candidates on the West Coast. Final date for filing application is March 1. *Oral.* For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology.* Philadelphia, April 17-18. Final date for filing application is Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: *Part I.* Various parts of the United States and Canada, January 16. Candidates notified of their eligibility to participate in Part I must submit their case abstracts within thirty days of notification of eligibility. No candidate may take the written examination unless the case abstracts have been received in the office of the Secretary. *Oral and Clinical.* Chicago, May 8-19. Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates. Candidates who participated in the Part I examinations will be notified of their eligibility for the Part II examinations as soon as possible. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), Various Cities, Jan. 26. *Oral.* Philadelphia, June 3-6. Sec., Dr. Merrill J. King, 22 White St., Rockland, Maine.

American Board of Orthopaedic Surgery: *Part I.* Washington, D. C., Denver, Colorado and Rochester, Minn., Mar. 26-27. Deadline for filing application was Nov. 30. *Part II.* Chicago, Jan. 21-23, 1959. Deadline for receipt of applications was Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 5-9. Final date for filing application is February. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Physical Medicine and Rehabilitation: *Written, Part I,* and *Oral, Part II.* Philadelphia, June 12-13. Final date for filing application is February 15. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

American Board of Plastic Surgery: *Oral and Written.* Boston, May 9-11. Final date for submitting case reports is Jan. 1. Corresponding Secretary, Miss Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8, Mo.

American Board of Preventive Medicine: *Written. Public Health.* Regional, Apr. 9-11. *Occupational Medicine.* Chicago, Apr. 17-19. *Aviation Medicine.* Los Angeles, Apr. 24-26. Final date for filing application for all three examinations is Jan. 15. Sec., Dr. Tom F. Whayne, 3438 Walnut St., Philadelphia 4.

American Board of Proctology: *Oral and Written.* Philadelphia, September. Final date for filing application is March. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Special Examination.* Cincinnati, Mar. 16-19, 1959. Final date for filing application was Nov. 1. Candidates completing training June 30, 1959 are not eligible for the Spring 1959 examinations. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: *Part II.* New York City, Dec. 15-16; Houston, Tex., Jan. 12-13; New Haven, Conn., Feb. 9-10; Durham, No. Car., March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: *Oral.* Los Angeles, April. Final date for filing application is Dec. 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

American Board of Urology: The oral will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

GOVERNMENT SERVICES

AIR FORCE

Personal.—Col. John E. Pickering, chief, department of radiobiology, has been named director of medical research at the U. S. School of Aviation Medicine, San Antonio, Texas. Colonel Pickering, formerly director of the Health Physics Society of America, is the author of textbooks entitled "Student Handbook of Weather" and "Air Navigation," and of many scientific papers.

ARMY

Personal.—Col. Floyd L. Wergeland, executive director, Office for Dependents' Medical Care, was promoted to the rank of brigadier general on Oct. 8. Formerly, General Wergeland was chief of the personnel division in the surgeon general's office.

Col. John L. Crawford, commanding officer, 9th Hospital Center, Landstuhl, Germany, was also recently promoted to the rank of brigadier general.

NAVY

Surgeon General Receives Peru Award.—Surgeon General Rear Adm. Bartholomew Hogan has been awarded the Peruvian Cross of Merit by the president of Peru and the Peruvian Navy. The decoration was presented through Rear Adm. Luis Edgardo Llosa, Naval Attaché, Embassy of Peru, Washington, D. C., Oct. 8, in connection with the celebration of Peruvian Navy Day. This award was made in recognition of the assistance the U. S. Navy Medical Department has given the Peruvian naval medical department.

VETERANS ADMINISTRATION

Wheel Chair Homes.—More than 5,400 seriously disabled veterans have received federal grants totaling more than 51 million dollars for "wheel chair homes," the VA has announced. As of Sept. 30, some 7,091 veterans who, because of service-connected disabilities, cannot get about without the aid of wheel chairs, crutches, braces, or the like, had established their eligibility for these special grants. Of these, 5,415 already have received the grants and either have moved into their homes or are in the process of having them built. The remainder have not yet put their plans into effect. The VA defrays 50% of the cost of "wheel chair homes" for eligible veterans up to a maximum of $10,000 under grants which were first authorized in 1948. The average grant is $9,468.

Research Program Expanded.—About 15 million dollars is available for VA medical research during the present fiscal year, and that is 5 million more than was available last year. The major new emphasis in the agency's research will be on studies of mental and physical deterioration associated with aging, says Dr. Martin M. Cummings, director of the *VA* research service in *Washington, D. C.*

PUBLIC HEALTH SERVICE

Nobel Prize Winners.—The three scientists who were awarded the 1958 Nobel Prize in Medicine and Physiology have been closely associated for many years with research supported by the National Institutes of Health (NIH). The NIH programs support scientific medical research of high caliber through grants for research studies, research training, and research facilities construction. Nearly half of America's medical research is supported through these grants, which will number some 7,000 this year. The awards are made on the recommendation of over 700 nonfederal advisers who review applications for grants as members of study sections and advisory councils.

Dr. Joshua Lederberg of the University of Wisconsin has been receiving an NIH grant for 10 years. He is a member of the newly formed Genetics Study Section of NIH, having been a member of the Morphology Study Section from 1949 to 1953. His current grant is from the National Cancer Institute. Dr. Edward Tatum of the Rockefeller Institute for Medical Research is a member of the Division of General Medical Sciences Genetics Training Committee and has received grant support from NIH since 1951. His current grant is from the National Cancer Institute. Dr. George Beadle, California Institute of Technology, was the first scientist to deliver a Dyer Lecture at NIH and is now receiving a National Heart Institute grant, working in experimental biology and genetics. His current project is expected to receive support until 1961.

Grants for Research in Metabolic Diseases.—Research grants and fellowships totaling $20,705,780 were awarded during September by the National Institutes of Health, at Bethesda, Md. Forty-seven per cent of the grant funds awarded during September are for support of research in arthritis and metabolic diseases. The grants were made to 337 institutions in 45 states, the District of Columbia, 2 territories, and 18 foreign countries. Research fellowships totaling $581,369 were awarded to 150 individuals for study in 93 institutions in 33 states, the District of Columbia, and 2 foreign countries.

Dr. Wright Receives Award.—Dr. Willard H. Wright, D.V.M., a Public Health Service consultant and former chief of the laboratory of Tropical Diseases of the National Institutes of Health was awarded the Walter Reed Medal by the American Society of Tropical Medicine and Hygiene. Research by Dr. Wright and co-workers resulted in improved control or treatment of such diseases as malaria, schistosomiasis, and filariasis. Advances were also made against trichinosis, toxoplasmosis, pinworm infection, and amebic dysentery.

DEATHS

Alderman, Mason Clarence, North Kansas City, Mo.; University Medical College of Kansas City, 1903; died Sept. 26, aged 87.

Andersen, Silas Carl Ⓜ Minneapolis; University of Minnesota Medical School, Minneapolis, 1925; member of the board of directors of the Hennepin County Medical Society; fellow of the American College of Surgeons; on the staffs of St. Andrew's and St. Barnabas hospitals, and the Fairview Hospital, where he died Sept. 27, aged 69, of shock and fracture of the pelvis as the result of a fall.

Anderson, Lester D. Ⓜ Chicago; Chicago Medical School, 1919; served as a member of the staff of the city health department; died in St. Petersburg, Fla., Sept. 25, aged 69, of cerebral hemorrhage.

Babcock, Elmer E., Alden, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1901; died June 29, aged 83, of arteriosclerosis.

Baker, William Washington Ⓜ Steubenville, Ohio; Meharry Medical College, Nashville, Tenn., 1920; died in the Ohio Valley Hospital Sept. 29, aged 64.

Balch, Franklin Greene Ⓜ Boston; Harvard Medical School, Boston, 1892; served on the faculty of his alma mater; member of the founders group of the American Board of Surgery; member of the American Surgical Association and the American Urological Association; fellow of the American College of Surgeons; served in France during World War I; honorary consultant at Massachusetts General Hospital; on the consulting staffs of Robert Breck Brigham Hospital and Faulkner Hospital, where he died Sept. 23, aged 94, of pulmonary fibrosis.

Barber, Robert Forrest, Sea Girt, N. J.; born in Elizabeth, Oct. 20, 1882; Long Island College Hospital, Brooklyn, 1908; clinical professor emeritus of surgery, State University of New York College of Medicine at New York City, Brooklyn; served in France during World War I and was made a Chevalier of the Legion of Honor by the French government; member of the founders group of the American Board of Surgery; a vice-president of the Kings County Medical Society; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association from 1938 to 1941; served on the staffs of the Long Island College Hospital, Kingston Avenue Hospital, and Kings County Hospital; consulting surgeon for the police department; died in the Monmouth Memorial Hospital in Long Branch Oct. 5, aged 75.

Bishop, Harry Arthur Ⓜ Bakersfield, Calif.; Northwestern University Medical School, Chicago, 1938; veteran of World War II; on the staffs of the Mercy, Kern General, and Bakersfield hospitals, and the Memorial Hospital, where he died Sept. 24, aged 48, of multiple pulmonary and brain abscesses.

Booth, Franklin H., Point Pleasant, N. J.; Columbia University College of Physicians and Surgeons, New York City, 1902; veteran of World War I; died Sept. 24, aged 81.

Boyd, Frank, Paducah, Ky.; Rush Medical College, Chicago, 1889; an associate member of the American Medical Association and served as a member of the House of Delegates in 1915; past-president of the Kentucky State Medical Association; fellow of the American College of Surgeons; veteran of the Spanish-American War; at one time county health officer; for many years on the staff of the Illinois Central Hospital and the Riverside Hospital; died in the Western Baptist Hospital Sept. 27, aged 90.

Bruner, Henry Clay, Louisville, Ky.; Hospital College of Medicine, Louisville, 1902; an associate member of the American Medical Association; formerly associated with the Veterans Administration; died in the Kentucky Baptist Hospital Sept. 24, aged 79.

Buchanan, Rogers Ross, Hannibal, Mo.; St. Louis College of Physicians and Surgeons, 1898; practiced in Philadelphia; died in the Levering Hospital Sept. 23, aged 88.

Chapman, William Herbert, Whitney, S. C.; Atlanta College of Physicians and Surgeons, 1906; served on the staff of the Mary Black Memorial Hospital in Spartanburg; died Sept. 24, aged 77, of Parkinson's disease and pyelonephritis.

Conway, John Michael, Spring Valley, Wis.; University of Illinois College of Medicine, Chicago, 1915; veteran of World War I; served on the school board and as health officer; died at his summer home on Lake Tainter, Menomonie, Sept. 22, aged 68, of coronary heart disease.

Crump, John Howard Ⓜ Long Beach, Calif.; New York Medical College and Flower Hospital, New York City, 1937; certified by the National Board of Medical Examiners; veteran of World War II; on the staffs of the Seaside Memorial, St. Mary's, Long Beach General, and the Long Beach Community hospitals; died May 2, aged 52.

Ⓜ Indicates Member of the American Medical Association.

Cuff, William Sherman, St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; on the staff of the Riverview Memorial Hospital, where he died Sept. 25, aged 83, of pneumonia.

Day, Kenneth Knowlton, Waterford, Conn.; Boston University School of Medicine, 1928; practiced in Malden, Mass.; member of the Massachusetts Medical Society; fellow of the American Society of Anesthesiologists; veteran of World War II; served on the staff of the Malden (Mass.) Hospital and the Lawrence Memorial Hospital in London, Conn., where he died Sept. 29, aged 57, of coronary occlusion.

Deemar, Paul Roscoe, Ford City, Pa.; Maryland Medical College, Baltimore, 1907; an associate member of the American Medical Association; veteran of World War I; died in the Butler County Memorial Hospital, Butler, Sept. 24, aged 77.

Ding, George Harvey, Orleans, Mass.; New York Homeopathic Medical College and Hospital, New York City, 1906; an associate member of the American Medical Association; member of the Medical Society of the State of New York; formerly practiced in Brooklyn, where he was on the staff of the Cumberland Street, Bay Ridge, and Methodist hospitals; died in Barnstable County Hospital in Cape Cod Oct. 7, aged 84, of arteriosclerosis and cerebrovascular accident.

Doll, Joseph Edwin, St. Louis; National University of Arts and Sciences Medical Department, St. Louis, 1912; died Oct. 1, aged 72, of arteriosclerosis.

Drake, Eugene Henry Ⓜ Portland, Maine; Medical School of Maine, Portland, 1919; served on the faculty of his alma mater; specialist certified by the American Board of Internal Medicine; a director and past-president of the Maine Heart Association; past-president of the Maine Medical Association; fellow and at one time governor of the American College of Physicians; at one time city physician; veteran of World War II, during which time he was chief consulting cardiologist for the Pacific Fleet, and winner of the Bronze Star for meritorious service aboard the hospital ship USS Solace in the Pacific; for many years associated with the Maine General Hospital, where he was chief of staff from 1937 to 1948, and past-president of the staff; medical consultant, Veterans Administration Hospital in Togus, Webber Hospital, Biddeford, Henrietta D. Goodall Hospital in Sanford, and Eastern Maine General Hospital in Bangor; instrumental in establishing the Blue Shield in Maine; in 1951 the Portland Kiwanis Club gave him a plaque for distinguished service; died in the Maine Medical Center Oct. 4, aged 66, of tetanus and diverticulitis.

Duncan, B. W., Waldron, Ark. (licensed in Arkansas in 1903); died Sept. 19, aged 86, of cerebral thrombosis.

Finney, Horace Maynard Ⓜ Chicago; Chicago Medical School, 1926; an employee of the Chicago Daily News; examining physician for Chicago Typographical Union number 16; died in the Illinois Masonic Hospital Oct. 8, aged 74, of pulmonary embolism.

Glogowska, Jadwiga, Alton, Ill.; Uniwersytet Poznański Wydzial Lekarski, Poznań, Poland, 1949; interned at the Evangelical Hospital and served a residency at the Cook County Hospital in Chicago; died in the Illinois Research Hospital, Chicago, Oct. 6, aged 35, of injuries received in an automobile accident in Madisonville, Ky.

Grant, Hugh D., Bath, Maine; Maryland Medical College, Baltimore, 1904; past-president of the Maine Medical Association; served as city physician; on the staff of the Bath Memorial Hospital; died Sept. 29, aged 87, of pneumonia.

Guion, Clarence Child, New Rochelle, N. Y.; University and Bellevue Hospital Medical College, New York City, 1899; an associate member of the American Medical Association; past-president of the Westchester County Medical Society; for many years on the staff and on the medical board of the New Rochelle Hospital; formerly director of the First Westchester National Bank of New Rochelle and trustee of the People's Bank for Savings; served as associate editor of *Westchester Medical Bulletin;* one of the founders and first president of the New Rochelle Professional Building, serving as member of its board of directors until 1946; died Sept. 30, aged 82, of cerebral thrombosis.

Hamilton, Charles H. Ⓜ Vermont, Ill.; Eclectic Medical Institute, Cincinnati, 1894; died Sept. 25, aged 89.

Harper, George Tinsley Ⓜ Dewey Rose, Ga.; Atlanta School of Medicine, 1910; on the staff of the Elberton–Elbert County Hospital in Elberton; died Sept. 29, aged 72, of coronary thrombosis.

Hobbs, Louis Lyndon, Chapel Hill, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1916; fellow of the American College of Surgeons; died Sept. 28, aged 75.

Isenberg, Bertice Alvin Ⓜ Lohrville, Iowa; Kansas Medical College, Medical Department of Washburn College, Topeka, 1908; died in the Veterans Administration Hospital, Des Moines, Sept. 20, aged 76.

Jewett, Earl Dayton, St. Paul, Ind.; Illinois Medical College, Chicago, 1904; veteran of World War I; died Sept. 25, aged 78, of a heart attack.

Kahlke, Charles Edwin Ⓜ Benton Harbor, Mich.; born in Rock Island, Ill., Jan. 13, 1870; the Hahnemann Medical College and Hospital, Chicago, 1894; at one time on the faculty of his alma mater;

specialist certified by the American Board of Surgery; fellow founder and life member of the American College of Surgeons, of which he was for many years governor, and from 1918 to 1920 vice-president; served as a vice-president of the Institute of Medicine of Chicago; past-president of the Chicago Surgical Society; once served on the advisory committee to the mayor of Chicago; veteran of World War I; honorary trustee of Chicago Wesley Memorial Hospital; for many years on the staffs of the Cook County Hospital and of the Chicago Memorial Hospital, where he was chief of staff; consultant at the Chicago Home for the Friendless; died Oct. 10, aged 88.

Kass, Albert Joseph Ⓜ Chicago; Loyola University School of Medicine, Chicago, 1940; on the staff of St. Mary of Nazareth Hospital; died Oct. 11, aged 44, of acute coronary occlusion and rheumatic heart disease.

Keiller, Violet Hannah Ⓜ Houston, Texas; born in Edinburgh, Scotland, in 1887; University of Texas School of Medicine, Galveston, 1914; for many years served on the faculty of the Baylor University College of Medicine; at one time on the faculty of her alma mater; specialist certified by the American Board of Pathology; member of the American Society of Clinical Pathologists; honorary member of staff at Hermann Hospital, where she was head of pathology from 1927 to 1951; the association of former interns and residents at Hermann Hospital donated a picture of her which now hangs in the hospital, and they established the Violet H. Keiller Award in her honor; under the fund, a scholarship is awarded each year to an outstanding resident; consultant at M. D. Anderson Hospital and Tumor Institute; died Sept. 24, aged 70, of coronary disease.

Kelso, John Calvin, Canonsburg, Pa.; University of Southern California School of Medicine, Los Angeles, 1900; an associate member of the American Medical Association; past-president of the Washington County Medical Society; physician for the Canonsburg School System for 19 years; veteran of World War I; on the staff of the Canonsburg General Hospital, where he died Sept. 22, aged 82.

Kitlowski, Henry, Pittsburgh; University of Pittsburgh School of Medicine, 1926; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons; member of the Medical Society of the State of Pennsylvania; on the staffs of the St. Francis, Eye and Ear, and Children's hospitals; died Sept. 17, aged 60, of coronary occlusion.

Knope, J. Colman Ⓜ Rochester, N. Y.; University of Buffalo School of Medicine, 1938; veteran of World War II; on the staffs of the Park Avenue Hospital and the Highland Hospital, where he died Sept. 30, aged 51, of myocardial infarction.

Lease, Raymond Essex Ⓜ Oyster Bay, N. Y.; Columbia University College of Physicians and Surgeons, New York City, 1920; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served as police surgeon for the Nassau County Police Department, a school physician, and health officer of the town of Oyster Bay; on the consulting staff at Meadowbrook Hospital in Hempstead, where he was a member of the board of managers; on the consulting staff of the Community Hospital in Glen Cove, where he died Oct. 1, aged 63.

Lemere, Henry Bassett, Laguna Beach, Calif.; born in Manchester, England, Feb. 1, 1872; University of Nebraska College of Medicine, Omaha, 1898; member of the faculty of his alma mater from 1900 to 1930, at which time he was head of the department of otolaryngology; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; an associate member of the American Medical Association; a life fellow of the American Academy of Ophthalmology and Otolaryngology; a senior member of the American Laryngological, Rhinological and Otological Society and was a contributor to their transactions; in 1936 organized the Beverly Hills Academy of Medicine and was its first president; during World War I ophthalmologist to U. S. Army Base Hospital 69 and served in this country and France in 1918-1919; consultant in ophthalmology to U. S. Army Hospital Center at Mesves, France; on the staff of Cedars of Lebanon Hospital in Los Angeles; died Oct. 6, aged 86, of arteriosclerotic heart disease.

Lytle, Ralph McKay, State Park, S. C.; Jefferson Medical College of Philadelphia, 1912; an associate member of the American Medical Association; served on the staff of the South Carolina Sanatorium; veteran of World War I; died in Columbia Hospital Sept. 27, aged 72, of perforated aneurysm in descending aorta.

MacKillop, Daniel Ⓜ Cambridge, Mass.; Baltimore Medical College, 1902; associated with Mount Auburn and Holy Ghost hospitals; died Sept. 28, aged 82, of cerebral thrombosis.

Maroney, Frederick William, Brooklyn; Tufts College Medical School, Boston, 1918; served for 10 years as associate professor of health and physical education at Teachers College, Columbia University in New York City; joined the Brooklyn College staff in 1941 and was made chairman of the department of health and physical education, named dean of students in 1944, and retired ten years later; died in the Peck Memorial Hospital Oct. 4, aged 74.

McKay, William H., Lackawaxen, Pa.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1908; died in the Wayne County Memorial Hospital, Honesdale, Sept. 25, aged 73, of cardiac decompensation.

Miller, Luther Edwin, Newton, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1954; service member of the American Medical Association; interned at the Greenville (S. C.) Hospital; for two years served with the U. S. Air Force Reserve at Waco, Texas; on the staff of Newton Hospital, where he died Sept. 29, aged 30, of rupture of the aorta.

Morse, George, Ludlow, Mo.; Eclectic Medical Institute, Cincinnati, 1902; died in the Chillicothe (Mo.) Municipal Hospital Oct. 4, aged 87.

Mull, Joseph Harry Ⓜ Rome, Ga.; Medical Department of Emory University, Atlanta, 1916; fellow of the American College of Surgeons; past-president of the Floyd County Medical Society; on the staff of the Floyd Hospital and the McCall Hospital, where he died Sept. 21, aged 67, of myocardial infarction.

Norris, Julia Anna, Minneapolis; Northwestern University Woman's Medical School, Chicago, 1900; retired director of the department of physical education for women at the University of Minnesota; died Sept. 18, aged 83, of myocardial infarction, arteriosclerosis, and hypertension.

Novak, Eduard, Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1917; member of the Medical and Chirurgical Faculty of Maryland; on the staff of the Bon Secours Hospital, where he died Oct. 6, aged 68, of hypertensive cardiovascular disease.

Painter, Thomas Edgar Ⓜ Radford, Va.; Medical College of Virginia, Richmond, 1931; member of the American Psychiatric Association; veteran of World War II; associated with the St. Albans Sanatorium; served as assistant physician and clinical director at the Eastern State Hospital in Williamsburg; formerly on the staff of the Westbrook Sanatorium in Richmond; died in the University of Virginia Hospital, Charlottesville, Sept. 21, aged 54, of carcinoma of the parotid gland.

Parker, Charles Edward, Corpus Christi, Texas; St. Louis College of Physicians and Surgeons, 1906; veteran of World War I; died Sept. 18, aged 76.

Pater, Joseph Louis Anthony Ⓜ Hamilton, Ohio; St. Louis University School of Medicine, 1930; veteran of World War II; on the staffs of the Fort Hamilton Hospital and the Mercy Hospital, where he died Sept. 30, aged 52, of cancer.

Patterson, Charles Luther, Westside, Iowa; Rush Medical College, Chicago, 1899; veteran of World War I and the Spanish-American War; died in the Veterans Administration Hospital, Omaha, Sept. 14, aged 89.

Petersen, Arthur Berg Ⓜ Spokane, Wash.; University of Oregon Medical School, Portland, 1947; specialist certified by the American Board of Internal Medicine; after an internship at the Wesley Memorial Hospital in Chicago, served a fellowship at the Mayo Clinic in Rochester, Minn.; captain in the Medical Corps, U. S. Air Force, during World War II and from 1951 to 1953; on the staff of the Sacred Heart Hospital; died in Seattle Sept. 5, aged 37.

Phillips, Edward Milliken Ⓜ Wheeling, W. Va.; Jefferson Medical College of Philadelphia, 1911; member of the Southeastern Surgical Congress and the American Association of Railway Surgeons; fellow of the American College of Surgeons; on the staffs of the Wheeling and Ohio Valley General hospitals; died Sept. 18, aged 72, of coronary sclerosis.

Pittenger, Earle Alexander Ⓜ Aberdeen, S. D.; Rush Medical College, Chicago, 1920; fellow of the American College of Surgeons; past-president and formerly councilor of the South Dakota State Medical Association; served as member of the city board of health; division surgeon for the Milwaukee Railroad; on the staff of St. Luke's Hospital; died in Rochester, Minn., Sept. 24, aged 66, of aortic stenosis and diabetes mellitus.

Powers, Earl Jennings Ⓜ Winston-Salem, N. C.; University of Cincinnati College of Medicine, 1932; fellow of the International College of Surgeons; on the staffs of the City Memorial and Kate Bitting Reynolds Memorial hospitals; died Sept. 21, aged 53, of cerebral thrombosis.

Potter, Henry Bertram Ⓜ Wakefield, R. I.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; before the United States entered World War I, went to France with the Harvard University Surgical Unit and became a captain in the Royal Army Medical Corps; received a citation from the King of England; for many years college physician for Rhode Island State College; senior surgeon on the staff of South County Hospital, where he died Sept. 15, aged 82, of embolism following a prostatectomy.

Rahming, Harry Ellsworth II Ⓜ Denver; University of Colorado School of Medicine, Denver, 1953; interned at St. Luke's Hospital; served a residency at Veterans Administration Hospital; associated with the Children's Hospital; served in the medical corps of the U. S. Army Reserve; died Sept. 14, aged 30, of cyanide poisoning, self-administered.

Reese, John Davies Ⓜ Philadelphia; Jefferson Medical College of Philadelphia, 1925; clinical professor of plastic and reconstructive surgery at his alma mater; specialist certified by the American Board of Plastic Surgery; member of the American Association of Plastic Surgeons and the American Society of Plastic and Reconstructive Surgery; chief plastic surgeon, Philadelphia General Hospital; consultant in plastic surgery at Montgomery Hospital in Norristown, Quakertown (Pa.) Community Hospital, and Veterans Administration Hospital; on the staff of the Jefferson Hospital, where he died Oct. 7, aged 65.

Rumore, Samuel Charles Ⓜ Coral Gables, Fla.; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1928; member of the Medical Society of the State of New York; formerly practiced in Brooklyn, where he was on the staffs of the Prospect Heights and Cumberland hospitals; died Sept. 22, aged 58, of acute coronary thrombosis and congestive heart failure.

Sanders, Matthew J., Lawton, Okla.; College of Physicians and Surgeons, Dallas, Texas, 1906; died Sept. 13, aged 74.

Shepard, Charles Angell Ⓜ Major, U. S. Army, retired, Denver; University of Buffalo School of Medicine, 1896; veteran of World War I; entered the medical corps of the U. S. Army in 1920 and retired May 31, 1934; died in the Veterans Administration Hospital Sept. 16, aged 86, of cerebral thrombosis.

Shoemaker, J. Donald, Mount Olive, Ill.; Chicago Medical School, 1947; died in the Community Memorial Hospital, Staunton, Sept. 23, aged 50.

Siegel, Morton Thelman Ⓜ West Covina, Calif.; Ohio State University College of Medicine, Columbus, 1951; certified by the National Board of Medical Examiners; specialist certified by the American Board of Ophthalmology; veteran of World War II; interned at the Los Angeles County Hospital in Los Angeles, where he served a residency; died Sept. 15, aged 36.

Silverman, Eli, Boston; St. Louis College of Physicians and Surgeons, 1926; Middlesex College of Medicine and Surgery, Waltham, Mass., 1930; on the staffs of the Peter Bent Brigham Hospital and the Boston City Hospital; died Sept. 16, aged 66.

Smith, J. Harvey, Miami, Fla.; Meharry Medical College, Nashville, Tenn., 1905; died Sept. 16, aged 69.

Smith, Wilbur Forrest Ⓜ Indianapolis; Indiana University School of Medicine, Indianapolis, 1921; member of the American Academy of General Practice and the Aero Medical Association; veteran of World War I and in World War II served for two years as chief of the Civil Aeronautics Administration medical standards board in Washington, D. C.; for many years chief examiner for the Civil Aeronautics Commission of Indiana; on the staff of the Methodist Hospital; died in the Whitley County Memorial Hospital, Columbia City, Sept. 10, aged 68, of bleeding duodenal ulcer.

Smith, William L., Denison, Texas; New York Homeopathic Medical College and Hospital, New York City, 1891; died Sept. 22, aged 90.

Southworth, Franklin Chester Jr., Framingham, Mass.; Harvard Medical School, Boston, 1924; specialist certified by the American Board of Psychiatry and Neurology; certified by the National Board of Medical Examiners; served on the faculty of the University of Buffalo School of Medicine; veteran of World War II; in 1926 appointed medical superintendent of the Woodside Cottages; formerly on the staffs of the Millard Fillmore and the Veterans Administration hospitals in Buffalo; on the consulting staff, Framingham Union Hospital, where he died Sept. 18, aged 60.

Spencer, Harry Dee, Idaho Falls, Idaho; State University of Iowa College of Medicine, Iowa City, 1897; fellow of the American College of Surgeons; past-president of the Idaho State Medical Association; veteran of World War I; on the staffs of the Idaho Falls Latter-Day Saints' Hospital and the Sacred Heart Hospital; died Sept. 17, aged 83, of pulmonary embolism following an automobile accident.

Sprunk, John Paul, Detroit; Detroit College of Medicine and Surgery, 1920; on the staff of the Grace Hospital; died Sept. 8, aged 76, of a cerebrovascular accident.

Stanley, J. Zeph Ⓜ Carmi, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; veteran of the Spanish–American War; on the staff of the Carmi Township Hospital; died in the Deaconess Hospital, Evansville, Ind., Sept. 15, aged 76, of coronary occlusion.

Strother, Edwin Bower Ⓜ Dallas, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1901; served on the staff of the Methodist Hospital; died Sept. 13, aged 84, of arteriosclerotic heart disease.

Tait, Edwin Forbes Ⓜ Norristown, Pa.; born in Philadelphia Aug. 25, 1894; University of Minnesota Medical School, Minneapolis, 1940; associate professor of ophthalmology at Temple University School of Medicine, Philadelphia; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology, Philadelphia College of Physicians, Association for Research in Ophthalmology, and the Pan-American Association of Ophthalmology; chairman, conservation of vision committee, Pennsylvania Academy of Ophthalmology; a vice-president and chairman of the economics committee, Medical Society of the State of Pennsylvania; fellow of the American College of Surgeons; co-founder of the National Medical Foundation for Eye Care; author of "Textbook of Refraction"; served on the staff of the Temple University Hospital in Philadelphia; consultant, North Penn Hospital in Lansdale; chief of the eye clinic of Montgomery Hospital, where he died Sept. 23, aged 64, of arteriosclerotic heart disease.

Takacs, Henry, Miami, Fla.; University of Michigan Medical School, Ann Arbor, 1920; died Sept. 16, aged 71, of cancer of the colon.

Thomas, Francis Xavier Ⓜ Feasterville, Pa.; Jefferson Medical College of Philadelphia, 1947; served on the staff of the Burlington County Hospital in Mount Holly; died Sept. 28, aged 41, in an automobile accident.

Vining, Harriet Augusta, Hastings, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1890; died July 12, aged 89, of a cerebral vascular accident and cardiac decompensation.

Voskuil, Anthony Ⓜ Santa Barbara, Calif.; Milwaukee Medical College, 1907; formerly practiced in Cedar Grove, Wis., where he was health officer; died Sept. 15, aged 81, of cerebral thrombosis.

Weber, Harry Matthew Ⓜ Rochester, Minn.; born in Lewistown, Mont., June 30, 1899; University of Minnesota Medical School, Minneapolis, 1926; interned at St. Joseph's and Ancker hospitals in St. Paul; entered the Mayo Foundation as a fellow in radiology in January, 1927; in October, 1931, became a member of the staff of the clinic as a consultant in roentgenologic diagnosis and in July, 1951, became head of the section of diagnostic roentgenology; appointed an instructor in radiology in the Mayo Foundation, Graduate School, University of Minnesota in 1932, and was advanced to professor in 1954; since 1935 a member of the medical corps of the U. S. Naval Reserve and was assigned to active duty in the grade of lieutenant commander, on Dec. 26, 1941, at the Naval Hospital in Corona, Calif.; released to civilian life on Aug. 12, 1942; specialist certified by the American Board of Radiology; vice-chairman of the Section on Radiology of the American Medical Association from 1947 to 1949; president of the Minnesota Radiological Society in 1940 and the American Roentgen Ray Society, 1953-1954; fellow of the American College of Radiology and consultant to the committee on x-ray department planning in 1951; member of the Radiological Society of North America, American Gastroenterological Association, Sigma Chi, and Phi Rho Sigma; honorary member of the Detroit Roentgen Ray Society, the St. Louis Medical Society, and the Society of Radiology and Physical Therapy of Havana, Cuba; in 1937 received the first award for his exhibit at the Fifth International Congress of Radiology; gave the Fred Hodges Memorial Lecture at the University of Michigan in 1958; on the staffs of the Rochester Methodist Hospital and the St. Mary's Hospital, where he died Oct. 4, aged 59, of a heart attack.

Williamson, Gladys Richarda Ⓜ New Orleans; University of Edinburgh Faculty of Medicine, Scotland, 1916; formerly on the faculty of Tulane University School of Medicine; member of the American Academy of Pediatrics; fellow of the American College of Physicians; chief of pediatrics at Sara Mayo Hospital; on the staffs of the Southern Baptist, Sara Mayo and Charity hospitals; died Sept. 19, aged 69.

Willoughby, Gordon Leslie Ⓜ Flint, Mich.; University of Manitoba Faculty of Medicine, Winnipeg, Man., Canada, 1926; veteran of World War II; member of the Flint Academy of Surgery; on the staffs of Hurley, McLaren, and St. Joseph hospitals; died Sept. 24, aged 58, of heart disease.

Wilson, George Hancock, Lexington, Ky.; born in 1884; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1910; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past-president of the Fayette County Medical Society; veteran of World War I; for many years a member of the executive board of the Alumni Association of the University of Kentucky and served two terms as president of the association; served as a member of the board of trustees of the University of Kentucky; for many years medical director of the Lexington city schools; on the staffs of the St. Joseph's, Good Samaritan, and Central Baptist hospitals; died Sept. 26, aged 74, of coronary thrombosis.

Wilson, Marion Childress, Miami, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; an associate member of the American Medical Association; specialist certified by the American Board of Obstetrics and Gynecology; veteran of World War I; at one time a medical missionary in Turkey; founder and first president of the Miami Obstetrics and Gynecology Society; on the staffs of James M. Jackson Memorial and St. Francis hospitals in Miami Beach; died Sept. 13, aged 72, of chronic myocarditis.

Wyche, George Griffin Jr. Ⓜ Alice, Texas; Temple University School of Medicine, Philadelphia, 1943; past-president of the Brooks–Duval–Jim Wells Counties Medical Society; member of the American Academy of General Practice; veteran of World War II; staff member of the Physicians and Surgeons Hospital; aged 40, instantly killed in a private plane crash Sept. 9.

Young, Roy Lowry Ⓜ Warren, Pa.; Jefferson Medical College of Philadelphia, 1905; past-president of the Warren County Medical Society; veteran of World War I; died Sept. 11, aged 78, of cancer.

FOREIGN LETTERS

AUSTRIA

Cortisone for Malignant Hemoblastoses.—At the meeting of the Society of Physicians in Vienna on Oct. 10, Dr. A. Stacher reported on 11 patients with malignant hemoblastoses who were given 250 to 500 mg. of prednisolone by mouth daily for 10 days. This treatment with large doses showed no advantage over the therapy with small doses (30 to 50 mg. daily in four patients with acute granulocytic leukemia). Five patients with lymphogranulomas had excellent remissions which lasted two or three months. One patient with lymphosarcoma showed good subjective improvement, while the mediastinal tumor receded only very slowly. No objective improvement could be achieved in a patient with carcinoma of the thymus. Side-effects, particularly concerning coagulation, in seven patients who had thrombopenia with hemorrhagic diatheses were observed. In one patient with acute leukosis a gastric ulcer developed. This was controlled with antacids. Since the cost of this therapy is very high, it should be used only if strongly indicated.

Marrow Biopsy.—At the same meeting, Drs. R. P. Königstein and G. Mähr described a method that facilitates the histological examination of marrow specimens obtained by sternal puncture. They mix 2 or 3 cc. of the aspirate with about the double quantity of isotonic sodium citrate solution then centrifuge. A top layer consists of tissue particles, the middle layer of serum and citrate, and the bottom layer of blood corpuscles. The large amount of fat contained in the medullary tissue is responsible for this behavior. Only if there is a small amount of fat or none at all in the medullary tissue can tissue fragments be found in the bottom layer with the corpuscles. These tissue fragments can be isolated by suspending them again in physiological sodium chloride solution and by repeated centrifugation. The histological work is carried out according to the ususal paraffin method. The occurrence of metastatic tumor and hyperplasia of the reticulohistiocytary system or of the lymphatic system in selected cases produces characteristic histological findings.

CANADA

Coxsackie Infection.—In a fairly well detached suburb of recent development, east of Toronto, an epidemic of an illness with fever, malaise, and sore throat attacked about 60 persons in the summer of 1957. A group from the Toronto School of Hygiene (*Canad. M. A. J.*, 79:615, 1958) recovered a virus having the characteristics of group A Coxsackie virus from 22 of 31 patients tested. The patients had distinctive ulcers in mouth and throat, and a bullous eruption arising from a macular exanthem. This condition is considered to represent a new clinical syndrome. Of affected households, 52% of the members became ill, but the illness was mild. Children were particularly prone to infection. In three patients further confirmation of the theory that this was a new type of Coxsackie infection was obtained by the demonstration of a specific antibody response to the related Coxsackie virus A type 16.

Myocarditis due to Sulfonamide Therapy.—Three veterans treated in Sunnybrook Hospital, Toronto, were found at autopsy to have signs of a peculiar acute interstitial myocarditis of a type seen in drug-induced hypersensitivity reactions. There was a characteristic accumulation of inflammatory cells throughout the heart muscle, with histiocytes and eosinophils predominating, and a certain predilection for perivascular areas. In two patients lesions were so severe as to be presumed the cause of death. Each of the patients had recently received the relatively new sulfonamide, sulfamethoxypyridazine, for a urinary infection. Blanchard and Mertens (*Canad. M. A. J.*, 79:627, 1958) suggested that this drug was responsible for these unusual changes. All three cases occurred within a relatively short time, and similar heart lesions had not been seen previously at this hospital.

Rehabilitation.—In a monograph, E. A. Dunlop, secretary of the Canadian Arthritis and Rheumatism Society, outlined a proposed plan for national action in the field of rehabilitation. He stated that rehabilitation is a social service which more than repays its cost through additional tax revenue over and above savings in public assistance and disability allowances. Certain favored classes of the disabled such as the blind, the veterans, and the injured workmen, have a comprehensive rehabilitation service while others have none. The author pleads that no social justification can be found for thus dividing the disabled into two classes. Like education, rehabilita-

---

The items in these letters are contributed by regular correspondents in the various foreign countries.

tion should include all the population concerned. Moreover, the voluntary agencies cannot be expected to cope with this huge task. The federal government should move into this field. Mr. Dunlop found three reasons why a nationwide policy has not been developed: 1. There is lack of assurance that federal grants will continue to match provincial expenditures. 2. There is a lack of clearcut federal policy. 3. Administrative responsibility in the federal government is divided between four or five separate divisions of two government departments. He urges the passing of a Disabled Persons Rehabilitation Act by the federal government, as a foundation on which a comprehensive nationwide program can be erected.

Influenza.—The Dominion Bureau of Statistics issued some information on the characteristics and trends of the influenza epidemic in Canada in 1957, in a monograph entitled "Influenza in Canada." The spread of the disease was peculiar in that it hit two central provinces (Ontario and Quebec) first, appeared on both the west and the east coasts three or four weeks later, and then invaded such intervening areas as Alberta last. This differs from the pattern in 1951, when the illness appeared practically simultaneously in all 10 provinces. The epidemic lagged behind the similar epidemic in the United States whence it presumably arrived, though once established in Canada it soon ran its course, lasting roughly three months from the beginning of September, 1957, to the end of November, with a peak during the second and third weeks of October (a week or two before the peak was reached in the United States). The incidence among civil servants varied from a high of 1,632 in Montreal to a low of 723 in Winnipeg. It is estimated that three million Canadians (18% of the population) were affected; children were particularly involved, and there was up to 90% involvement in Indian reservations and in some northern settlements.

Hemolytic Disease of the Newborn.—Thanks to the initiative of the Ontario Medical Association, later backed up by the provincial department of health and the Junior Red Cross, the province of Ontario now has an organized program for dealing with cases of hemolytic disease of the newborn. This program is described in a brochure prepared by the Committee on Child Welfare of the Ontario Medical Association. Briefly the scheme is as follows: a physician may have Rh screening of his pregnant patients made at one of several laboratories attached to treatment center hospitals, at laboratories of the Ontario Department of Health, or at Canadian Red Cross Transfusion laboratories. For follow-up titrations of antibodies in patients in whom these are discovered, a number of treatment center hospital laboratories are available, as well as the Red Cross laboratories and certain health department facilities. There are also five reference laboratories for elucidation of difficult cases, for personnel training in technique, and for general consultation. If possible, the Rh-sensitized mother will be delivered in a treatment center hospital, which is equipped and staffed to give postnatal care. If the procedure outlined is followed by all Ontario physicians, it could reduce the mortality from hemolytic disease of the newborn to 5% or less and could obviate most or even all of th ecomplications.

DENMARK

Danish Medical Association.—From time to time the Central Committee of the Danish Medical Association tells its members how it serves them. The latest of these accounts (*Ugeskrift for læger,* Sept. 4, 1958) shows how often requests for help have to be refused because they are outside the purview of the Association. For example, one of its functions is to help draw up contracts between physicians with a view to avoiding forensic loopholes, but when such help is not requested, and a contract has been challenged, the Association is under no obligation to mend matters. Its self-imposed duties are great and varied, with its function as buffer between the health insurance authorities and individual members of the medical profession taking much of its time. These authorities may complain that certain physicians are too liberal in their prescription of expensive foreign drugs when Danish alternatives are much cheaper. In this respect some districts are distinguished by clusters of physicians who with few exceptions are profligate with expensive prescriptions.

The Association has also to advise on the merits of new drugs. In the past year 174 such applications were made to the Association. It also is responsible for the qualifications of chiropodists, 33 of whom were authorized by it to act as such in the past year. A comparatively new function of the Association is to grant certificates of proficiency to physician's secretaries. This highly specialized service, requiring a happy blend of office routine and medical problems, has not hitherto been given the appreciative recognition it deserved, and in January, 1958, the first applications for such certificates were received. Most of the 274 applicants were already occupied in this service, but in many of these cases supplementary training was required before the certificate could be conferred.

Tetanus Antitoxin.—Between Oct. 1, 1955, and Sept. 30, 1956, the Sundby Hospital emergency service dealt with 14,702 accident cases in 1,656 of which prophylactic injections of tetanus antitoxin were indicated and in 1,343 of which they were given. To ascertain how these 1,343 had reacted, Samsöe-Jensen and Zachau-Christiansen (*Ugeskrift for læger,* Sept. 11, 1958) sent a questionnaire to each of them about a year later, soliciting information on such subjects as side-effects or complications, time and duration, incapacity for work, and whether they had or had not been given such prophylactic treatment previously. Only 70 failed to answer. Only 64 of the 1,273 who answered had experienced side-effects, which in 20 cases could be described as serum sickness. A reaction at the site of the injection was in some presumably of an allergic character. Other reactions were urticaria, adenitis, or articular symptoms. In only three patients were the side-effects prolonged. More than 33% of those given tetanus antitoxin had received similar treatment earlier, some several times, so the risk of serum sickness on this account was slight.

Health of Denmark.—A comparison of the behavior of the reportable diseases in 1956 and 1957, respectively, by Dreyer and Frandsen (*Ugeskrift for læger*, Sept. 18, 1958) showed how greatly some of them fluctuated from one year to the next. This was notably the case with influenza, whose incidence was 5 times greater in 1957 than in 1956, while its case fatality rate was 10 times higher. This may partly explain why the total death-rate rose from 8.9 per 1,000 in 1956 to 9.3 in 1957. In this year the deaths from all forms of tuberculosis fell to 4.4 per 100,000, more than trebling the number of deaths from traffic accidents. In the same year malignant disease plus arteriosclerosis and degenerative disease of the heart accounted for 46% of all the deaths. Accidents accounted for 4.8% of all the deaths in 1957. Since 1954 the reports of gonorrhea showed a slight tendency to fall, but there were still 7,447 reported cases in 1957. The reports of acquired syphilis fell from 104 in 1956 to 48 in 1957. Between the same years the reports of acute poliomyelitis fell from 191 to 26, only 10 which were paralytic. Diphtheria seems to have been wiped out, temporarily at any rate, for not a single case was reported in 1956 or 1957.

Frequency of Thromboembolic Lung Lesions.—Investigations into the frequency of thromboembolic lung lesions in adults examined post mortem have yielded divergent findings, with about 10% recorded by T. H. Belt in 1934, and 23% by T. J. Moran in 1947. In *Nordisk medicin* for Oct. 2, Bang and co-workers published their findings, which concerned postmortem examinations in 1954 and 1955 on 1,788 patients over the age of 15. In 271 cases (15%), thrombi, emboli, or infarctions were found. In only 16% of these cases had this condition been diagnosed during life, and the failure to do so was particularly noticeable in the case of elderly, decrepit patients. A scrutiny of the clinical record of each of these patients led to the conclusion that the lung lesions would not have been so often overlooked had they been kept in mind when tachycardia came on suddenly with increasing cardiac insufficiency and an inexplicable rise of temperature not responding to antibiotics. The antemortem rate of correct diagnoses was highest for the 84 patients in whom the course of events had been rapid, with less than 24 hours between the onset of symptoms and death.

Cough Syncopy.—At a meeting of the Danish Society for Internal Medicine (reported in *Nordisk medicin* for Oct. 2) several speakers discussed the importance to traffic accidents of cough syncopy Four such cases were recently dealt with by a invalid board in one year. In the case mentioned by Dr. M. Schwartz the patient was a 45-year-old professional chauffeur. This mishap overtook him o three occasions while driving, and during one o them he drove into a house. His license to driv had to be cancelled. Another speaker who referre to four similar cases with patients aged 45, 49, 6 and 62, respectively, pleaded for a more critic medical examination of prospective drivers. H wished to extend it not only to possession of th main senses and general mobility, but also to freedom from brief lapses of consciousness while th driver is at the wheel. Derbes and Kerr in an earli monograph showed that the victims of this cond tion were nearly always men between the ages o 40 and 70, suffering from chronic asthma, bronchitis, and emphysema. They were also often heavy men addicted to tobacco.

INDIA

Determination of Sex.—Gadgil and Deodhar (*Indian J. M. Sc.* **12:**6 [June] 1958) stated that the presence or absence of a specific chromatic mass in the nuclei of somatic cells can be used to determine the sex of an individual. This mass has been called nucleolar satellite when found in nerve cells and sex chromatin in other somatic cells. The authors studied smears from different tissue fluids with a view to determine sex from examination of the cells and their nuclei. Thus smears of buccal mucosa were collected from 100 males and 100 females of ages ranging from 10 to 50 years; 95 smears from amniotic fluid obtained by puncture just before delivery were also similarly studied, and routine blood films from 150 persons with normal total and differential leukocyte counts were prepared. The oral smears showed two types of cells—large with pyknotic nuclei and smaller with vesicular nuclei. The latter were examined for the presence or absence of sex chromatin mass. In all males the chromatin was in the form of small particles of irregular size distributed evenly in the protoplasm with a predilection for nuclear membrane; in females the typical feature of the nucleus was the presence of a distinctly hyperchromatic mass planoconvex in shape.

The amniotic fluid smears showed three types of cells—very large with pyknotic nuclei in different stages of degeneration, basal cells, and precornified cells. The chromatin mass in the latter two types of cells from female infants was at the nuclear membrane in most of the cells. The nucleus of the polymorphonuclear cells in blood smears showed the typical appendage or drumstick in females in 97% of cases. Smear examination of blood helped to arrive at a correct diagnosis of sex in all the 100 smears studied from males, while the diagnosis was missed in 3 of the 100 females. The study of smears from oral mucosa and the blood could easily be used as a routine procedure. The results of examination of oral smears were more accurate than the study of polymorphonuclear cells from blood smears. Although amniotic fluid smears gave accurate results, the procedure of obtaining the fluid at an early stage is not without risk both to the mother and to the fetus.

Treatment of Tetanus.—Patel and Joag (*Indian J. Med. Sc.* 12:6 [June] 1958) stated that the value of antitetanus serum in the treatment of tetanus has been established conclusively by animal experiments. There are, however, variable opinions regarding the effective dose. The authors studied a series of patients treated with varying doses of the serum. Thus, 816 patients were given a total dose of 240,000 units of antitetanus serum, 243 received 120,000 units, and another 243 were given 60,000 units. The difference in results in the three groups was not significant enough to show any correlation between mortality and dose level. Thus, results with 60,000 units were as good as those with 240,000 units. Even the percentage of deaths occurring after 48 hours was the same in the three groups. The advantages of using a smaller dose, besides being less costly, were that there was less pain at the injection site and the chances of abscess formation were reduced.

Treatment of Cancer.—There are 40 hospitals in India with the latest equipment for the treatment of cancer. The steps taken by the government for checking the spread of cancer included (1) the establishment of the Indian Cancer Research Center in Bombay in 1952 for postgraduate teaching and for research in cancer and allied subjects, (2) taking over by the government of the Chittaranjan National Cancer Research Center, Calcutta, in 1957, (3) grants-in-aid to five institutions treating cancer, (4) taking over by the government in 1957 of the Tata Memorial Hospital, Bombay, to facilitate research work at the Indian Cancer Research Center, and (5) the installation of three cobalt bomb therapy units in the Tata Memorial Hospital, Bombay, the Chittaranjan National Cancer Research Center, Calcutta, and the Christian Medical College, Ludhiana, respectively.

Tuberculosis Survey.—The preliminary report of the survey up to June 1956 by the Indian Council of Medical Research showed that tuberculosis was prevalent in villages, small towns, and cities; 2% of the people in the areas covered had the disease. It was concluded that (1) the morbidity of tuberculosis varies from 7 to 30 per 1,000 persons in different areas, (2) the prevalence of tuberculosis is not so marked as originally expected, (3) the morbidity rates are lower for females than for males, (4) the prevalence of tuberculosis among the persons of the age group of 45 years and above was much higher than that for the age group of 5 to 34 years, and (5) bacteriologically positive cases varied from 1 to 11 per 1,000 persons in different areas. The government formulated a national tuberculosis control program to include intensification of the BCG vaccination campaign, upgrading of 300 tuberculosis clinics to provide or expand facilities for diagnosis and domiciliary treatment, establishment of 15 tuberculosis demonstration and training centers, establishment of 4,000 tuberculosis isolation beds, and establishment of eight follow-up centers for tuberculosis patients.

Spider Nevi and Liver Disease.—H. Singh and coworkers (*Current M. Pract.* 2:8 [Aug.] 1958) stated that spider nevi have often been noticed in association with liver disease. They may disappear with improving hepatic function, while the appearance of fresh nevi suggests progression of parenchymal liver damage. Spider nevi are, however, rare in Indian patients suffering from hepatic disease. Thus, of 250 consecutive patients with hepatic cirrhosis, only 4 showed the presence of such nevi. The authors studied 31 patients with portal cirrhosis including 2 with postnecrotic scarring to find out whether percutaneous administration of estrogen could lead to the production of spider nevi in a larger number of patients with liver damage. Skin areas were treated with 1% ethinyl estradiol ointment in a lanoline base or alcoholic solution. In 20 patients the application was made for 7 to 10 consecutive days and in the rest for 5 days. They were followed for 5 to 27 days after the last application. None of the patients developed spider nevi in the treated areas or in the untreated parts. Thus, the inunction of estrogen had little effect in the production of spider nevi.

Acetylcholine Content of Intestine.—B. G. Bose and co-workers (*Indian J. M. Sc.* 12:7 [July] 1958) reported that the different segments of intestine showed different inhibitory responses to epinephrine and arterenol, epinephrine having a greater inhibitory action on the ileum and arterenol on the colon. These variations may be related to the acetylcholine content of these tissues. The authors therefore studied the inhibitory responses and the acetylcholine content of segments of duodenum, jejunum, and colon of adult male albino rats. The acetylcholine content of the different segments showed significant variation, and, on an average, the colon contained less acetylcholine as compared to duodenum and jejunum. The inhibitory response was maximal in the jejunum and lowest in colon. Thus, a correlation was found to exist between the degree of inhibitory response and the content of acetylcholine in the intestinal segments. Epinephrine caused greater inhibition of the tissues containing more acetylcholine than arterenol. As arterenol is not affected much by acetylcholine content, its inhibitory action on the colon, which is poorer in acetylcholine, is more predominant as compared to that of epinephrine.

Tropical Eosinophilia.—R. S. Mehta (*Indian J. M. Sc.* 12:7 [July] 1958) studied the electrocardiographic tracings in 80 patients with classic tropical eosinophilia and compared them with the tracings from 50 healthy adults. In each case three standard limb leads, three unipolar limb leads, and six unipolar chest leads were taken. Changes of hyperkalemia were seen in about 46%. The serum potassium level was estimated in all but nine cases, but there was no exact correlation between the serum potassium level and the electrocardiographic evidence of hyperkalemia, although the incidence of hyperkalemic changes definitely rose when the serum potassium level was above 20 mg. per 100 ml. The incidence of hyperkalemia rose *pari passu* with the total eosinophil count up to a certain level; 44% of the tracings showed either left or right ventricular preponderance, the distribution being 31.25% and 12.5% respectively. Thus, the incidence of left ventricular preponderance was 2.5 times that of the latter. Vertical heart was present in 80% of the series and even in those with left ventricular preponderance. Among the controls, vertical heart was present in 56%. Of the 80 patients, 13 showed tachycardia, the pulse rate varying from 105 to 140 per minute, while 2 showed bradycardia, the rate being 52 and 54 respectively. Nine tracings from the patients and one from the controls showed low voltage. In 14 patients the P wave was more than 2.5 mm. in height and suggestive of "P" pulmonale, while in 10 it was small, flat, or biphasic. Conduction changes were seen in 20 patients and 10 controls, consisting of intraventricular conduction disturbances with marked slurring of the ventricular complex.

Bacitracin and Amebiasis.—DeMelloe and Patel (*Indian J. M. Sc.* 12:6 [June] 1958) stated that bacitracin, in addition to its antibiotic action, also possesses amebicidal action. As it is not absorbed from the intestine, it exerts maximal amebicidal action and also eliminates the secondary invading organisms. The authors studied the effect of bacitracin alone and in combination with streptomycin in persons with asymptomatic amebiasis who were passing cysts or vegetative forms of Endameba histolytica. Because the antibacterial spectrum of bacitracin resembles that of penicillin, streptomycin was selected for its action on gram-negative organisms. Stool examination was repeated after a saline purgative after three weeks of treatment on three occasions at intervals of one week. Persons with all three results negative were considered cured. Bacitracin alone was used in three different dosage schedules—2 tablets of 5,000 units each, four times a day for seven days on five patients; 2 tablets of 12,500 units each, four times a day for three days on four patients; and 2 tablets of 12,500 units each, four times a day for seven days on four patients. When used in combination with streptomycin, each tablet contained 5,000 units of bacitracin and 125 mg. of streptomycin. Two such tablets were given four times a day for 10 days to 11 patients. The results on the whole were variable when bacitracin alone was used, the cure rate being much higher with the combination than with the single drug. Thus 9 of the 11 patients treated with the combination were cured. Although the dose of bacitracin in combination is small, it probably has a synergistic action with streptomycin in clearing the amebic infection.

NEW ZEALAND

New Approach for Hiatal Herniorrhaphy.—J. Borrie (*British Medical Journal*, September 20, 1958, p. 728) reported that, although the right-sided approach is a standard procedure for performing esophagectomy for carcinoma of the midesophagus, no record has been encountered of the use of this approach for repairing hiatal hernias. The author described an occasion when, because of a misdiagnosis, a right thoracotomy was performed, and a hiatal hernia was unexpectedly found and successfully repaired through the right pleural cavity. The fact that this right-sided approach proved as satisfactory as that from the left side indicates that the former is another possible route for the repair of such lesions.

Thyroid-Stimulating Hormone.—Dr. D. D. Adams (*Journal of Clinical Endocrinology*, vol. 18, p. 699, 1958) reported that when investigated for their content of thyroid-stimulating hormone (TSH) some human serums induced abnormal responses in the TSH assay. In the normal response, the I^{131} level in the guinea pig's plasma was higher 3 hours after the intravenous injection of the TSH than it was 16 hours after. In the abnormal response, elicited by serums from some patients with thyrotoxicosis, the reverse occurred—the guinea pig's plasma I^{131} level was higher 16 hours after the intravenous injection of the serum than it was 3 hours after. These observations prompted an investigation of the mechanism of the abnormal response and the type of response elicited by the TSH present in human, bovine, and murine pituitary glands, and in the blood of thyroidectomized rats and a variety of human subjects. Since the size of the abnormal response was not reduced by injection into the test guinea pig of a massive dose of thyroxine, it was unlikely that the abnormal TSH response was due to blockage of the thyroxine-inhibition of endogenous TSH secretion from the test guinea pig's pituitary gland. When U. S. P. thyrotropin reference substance was added to a serum that elicited the abnormal TSH response, the magnitude and time course of the response induced by the mixture indicated that the two components acted independently. It is probable, therefore, that the abnormal response was a manifestation of the presence of an abnormal TSH.

The finding of abnormal responses only to serums from patients with thyrotoxicosis makes it probable that the abnormal TSH had some relationship to this disorder, but the data collected so far were not adequate to exclude with certainty the possibility that abnormal TSH might occur in conditions other than thyrotoxicosis. It has been shown that serums from some patients with exophthalmos and hyperthyroidism had the power to increase markedly the acinar cell height of the thyroid glands of thyroxine-injected guinea pigs. In the light of the findings of the present investigation it is likely that these serums contained the abnormal TSH, which apparently affected thyroid morphology in a way similar to that of normal TSH. It may be that abnormal TSH differed from the normal in the length of its stay in the blood. Possibly it was normal TSH combined with some other material. Abnormal TSH might also be present in all cases at a level too low to be detected by the present assay procedure. It is possible, therefore, that the abnormal TSH plays a causative role in the hyperthyroidism of thyrotoxicosis. It may also be implicated in the cause of exophthalmos. It is possible that the exophthalmos-producing substance found by Dobyns and Wilson in 1954 in the serum of patients with progressive exophthalmos, was the abnormal TSH. The site of production of the abnormal TSH remains unknown, but suspicion naturally falls on the pituitary.

UNITED KINGDOM

Intra-articular Hydrocortisone.—The intra-articular injection of hydrocortisone acetate is generally regarded to be of value in the treatment of rheumatoid arthritis, and most patients seem to derive subjective, even if transient, benefit. Chandler and Wright, however, reported that despite a good clinical response to injections of hydrocortisone derivatives, radiologic deterioration, sometimes extensive, occurs in the knees of over 50% of the patients so treated (*Lancet* 2:661, 1958). In one patient a neurogenic arthropathy was produced in a joint treated over a period of 18 months by monthly injections of hydrocortisone. The patient obtained almost complete relief of pain but at the expense of a functionless joint. Radiographs of the knees of 25 patients with rheumatoid arthritis were obtained before and after a course of treatment with hydrocortisone. Radiologic deterioration occurred in 13, despite clinical improvement in the majority. The authors believed that by a local mechanism in which functional improvement and relief from pain were the most important features, interference with the normal protective processes natural to inflammatory disease might have encouraged a degree of weight-bearing and mobility which was inherently traumatic. Dangerous progression of the disease under these circumstances might be expected.

Death due to Change of Anesthetic.—During a dental extraction a 6-year-old boy died from cardiac arrest. At the inquest the dentist stated that he first gave the boy nitrous oxide and then trichloroethylene. After three extractions the boy showed signs of returning consciousness and for five seconds ethyl chloride was administered while two more teeth were removed. Then the boy's respiration rapidly became shallow, and he collapsed and died in spite of attempts at resuscitation. Questioned by the coroner, the dentist said that he knew that there was some danger attached to giving trichloroethylene and ethyl chloride, but he did not think there was any risk in this particular case as the boy was strong and healthy. He agreed that it would have been safer to have used nitrous oxide alone. In his opinion the ethyl chloride caused the death. An anesthetist testified that the giving of trichloroethylene and ethyl chloride was widely practiced provided patients were not susceptible to a sudden change in anesthetics; trichloroethylene was dangerous for some patients; and ethyl chloride more so, particularly for young children. He thought that for dental extractions nitrous oxide was safer.

Malaria and Prematurity.—Cannon investigated the association of malarial infection and prematurity in Nigeria (*Brit, M. J.* 2:877, 1958). He studied 12,000 attendances by expectant mothers and 815 deliveries in hospital. The relationship between malarial infection of the placenta and the weight of the child at birth was determined in 392 single deliveries. The others were excluded, as the mothers had taken antimalarial drugs. Immediately after delivery of the placenta a wedge-shaped piece was cut from the maternal aspect of the placenta and a smear examined for malarial parasites. The infants were weighed and those weighing less than 2,500 Gm. (5.5 lb.) were classified as premature. Of 362 newborn babies, 30% had a placenta infected with malarial parasites, and the mean birth weight of those infected was 310 Gm. (11 oz.) less than those not infected. In deliveries where the placenta was found to be infected, 33% of the babies were premature, but in the deliveries in which the placenta was noninfected only 12% of infants were premature.

New Anticoagulant.—Results of clinical trials with a new anticoagulant, anisindione, are described by Kellaway (*Brit. M. J.* 2:889, 1958). In tests on volunteers it was found that a dose of 300 mg. of the drug given orally had an effect within six hours on the prothrombin time, lowering it to 50 to 70% of its normal value. Maximal lowering to within 10 to 20% of normal occurred within 24 hours in over half the subjects tested. Twenty-five patients with myocardial infarction, increasing coronary insufficiency, and deep venous thrombosis of the legs were given anisindione, starting with an initial dose of 200 mg. A satisfactory response, with prothrombin levels to within 10 to 20% of normal, was obtained in all patients. These levels were maintained by a daily maintenance dose of 25 to 350 mg. (average 100 mg.). The prothrombin level returned to normal within 36 to 72 hours of stopping treatment. No toxic side-effects were observed, and there was no evidence of hemorrhage or disturbed liver function. The anticoagulant effect of anisindione was rapidly reversed by vitamin K_1 in doses of 20 mg. orally and within four hours when the vitamin was given intravenously. Kellaway considered that anisindione has certain advantages over phenindione and the other anticoagulants in the speed and predictability of the initial response and the subsequent rapidity with which therapeutic blood levels of the drug can be obtained.

Asthma Treated by Hydrocortisone.—The condition of patients with bronchial asthma can be greatly improved by systemic treatment with corticosteroids, but large doses must be used, with the attendant risk of cortical atrophy and the usual side-effects. Continued treatment by this means must therefore be limited to patients whose life is endangered or in whom invalidism is threatened. Herxheimer and co-workers achieved a similar therapeutic effect by local instead of systemic treatment, using inhalations of hydrocortisone powder (*Brit. M. J.* 2:762, 1958). Patients were advised to inhale the contents of a capsule containing 15 mg. of micronized hydrocortisone snuff from a powder inhaler, half being inhaled in the morning and the remainder in the evening. The dose of 15 mg. was chosen on the assumption that only a small amount of this would be distributed systemically and would be below the body's own level of production of corticosteroids. Seventy-nine patients with chronic asthma, who had been observed for several years, were treated, and in 45 treatment was controlled with a placebo inhalation. In 33 of the 45 a definite improvement occurred, mainly in those asthmatics with evidence of allergic etiology and in those without hypersecretion. Improvement occurred in only 50% of the patients with infective cases. Patients with co-called "dry" asthma showed dramatic improvement. This treatment was of value in certain types of asthma.

Helm and Heyworth also concluded that inhalation of hydrocortisone acetate powder is an effective short-term treatment for some patients with bronchial asthma (*Brit. M. J.* 2:268, 1958). Rapid improvement occurred when they were changed from a placebo to hydrocortisone. Capsules containing 15 mg. of hydrocortisone acetate powder were used and patients instructed to adjust the number of inhalations to the response obtained. Half a capsule twice a day to three capsules daily were taken, most patients being maintained on one capsule a day. The assessment of the results was based on subjective and objective improvement. Of the patients in this series, 82% improved with the inhalations and 33% with the placebo. The difference is statistically significant. Little or no benefit was obtained in patients with chronic bronchitis treated by this method. In a longer-term trial in patients with recurrent acute asthma, the inhalations were effective in controlling the condition, but there was a strong tendency to relapse when the treatment was continuous. Better results were obtained when the inhalations were used intermittently for the attacks. The authors did not recommend this form of treatment in the dangerously ill patient. They estimated that a large portion (about 75%) of the inhaled hydrocortisone was absorbed, but even so the dosage was small compared with that used orally.

Nylon Alopecia.—A new type of traumatic alopecia was reported by Dr. Agnes Savill, who was consulted by a number of patients of both sexes because of falling hair without obvious cause (*Brit. J. Dermat.* 70:296, 1958). All gave a history of using hair brushes with nylon bristles. Examination showed that hairs had been pulled out by the roots or had been broken off and split longitudinally by these brushes. This finding is not unexpected from the very nature of nylon, which is tough, hard, and virtually indestructible. A substance that makes good pot-scourers could hardly be expected to be kind to the hair. Dr. Savill also blamed the shape of the ends of the nylon bristles, which are cut off square, instead of being rounded like hog bristles, and are therefore more traumatic. Recovery without treatment occurred in the patients when they ceased to use nylon brushes.

CORRESPONDENCE

RADIUM POISONING

To the Editor:—In the article "Where Are the Cases of Radium Poisoning," by S. D. Clark (*J. A. M. A.* 168:761-762 [Oct 11] 1958), spontaneous fractures, osteogenic sarcoma, and neoplasms of the paranasal sinuses are mentioned as signs of radium poisoning. Although brief mention is also made of roentgenological changes and trouble with teeth, the characteristic production of radiation osteitis and focal necrosis of teeth is of more than passing importance. Radiation osteitis has been found to affect the bone of the mandible and maxilla in a large proportion of the radium-dial workers I have examined. The findings on roentgenograms are similar to those of osteitis deformans (closely distributed areas of osteosclerosis interspersed with areas of osteoporosis). The alveolar processes of the jaw bones are affected more often than other bone because of their metabolic activity. Focal necrosis of the teeth also seen on roentgenological examination resembles dental caries, but the lesions are more sharply defined and occur on root surfaces below the gum line and under intact enamel. These two findings may be discovered on routine dental x-ray check-up and may be present long before any teeth are lost or long before fracture, sarcoma, or neoplasm supervene. These characteristic oral and dental lesions can be recognized easily by the alerted dentist and physician. The mottled osteitis and the dental focal necrosis are specific findings in this disease, and their presence may be regarded as pathognomonic (Dalitsch, *Fortnightly Rev. Chicago Dental Soc.* 18:5-7, 26 [July 15] 1949).

Walter Wm. Dalitsch, M.D.
30 N. Michigan Ave.
Chicago.

Dr. Dalitsch's letter was referred to Dr. Clark, and his reply follows.—Ed.

To the Editor: —Dr. Dalitsch is quite correct in emphasizing the dental changes that occur in radium poisoning and I agree that these characteristic areas of focal necrosis may appear long before any of the other lesions. The sclerotic changes mentioned in my article are considered to be part of the findings of radiation osteitis. Any support from the dentists would be most welcome. In an article directed toward dentists, the dental changes should be pointed out more specifically as Dr. Dalitsch has done in his letter.

TRAINING IN PEDIATRICS

To the Editor:—The address "Pediatrics in Transition," by Wheatley, in The Journal (168:856-859 [Oct. 18] 1958) is of interest. It is indeed commendable that some of the disciples of pediatrics should be yearning for new fields of interest, as a result of the accomplishments of their specialty and others in the field of preventive medicine.

I would like to offer an idea concerning postgraduate education which may fill a void in the lives of some of those charged with the job of "child health supervision." I suggest that pediatric residency training include experience in anesthesiology. In most areas of our country there is a shortage of physicians qualified in the administration of depressant drugs and the management of patients whose vital functions are depressed as the result of poisoning, infection, and trauma. A not inconsiderable number of surgical patients come from the pediatric age group. Certainly, the physician particularly trained in the psychology, physiology, and pathology of these patients could perform a needed service if he were trained in the applied pharmacology and physiology of the administration of the general depressants. He and others could serve their patient better at the head of the operating table than by assisting or observing on the other side of the ether screen.

Leo J. DeBacker, M.D.
State University of Iowa
Iowa City.

BACTERIAL ENDOCARDITIS DUE TO PSEUDOMONAS AERUGINOSA

To the Editor:—The report on a case of bacterial endocarditis due to Pseudomonas aeruginosa, by McDonald, Rhoads, and Knapp (*J. A. M. A.* 167:1490-1493 [July 19] 1958), is of great interest. We cannot subscribe, however, to the authors' opinion about the outcome being invariably fatal. In contradistinction to the 10 cases summarized in the paper, the treatment of which proved unsuccessful, though only two were observed after the advent of antibiotics, we had the opportunity to record a case in which there was full recovery (Gottsegen and Romoda, *Samml. seltener klin. Fälle* 13:115-120, 1957). Subacute endocarditis in a young man with rheumatic mitral stenosis and regurgitation began with a long period of freedom from bacteremia. Antibiotics (penicillin, streptomycin, and chloramphenicol) failed to show any effect on fever and hematuria. At last, blood and urine cultures became positive for Ps. aeruginosa; on the basis of favorable experiences in earlier cases with resistant germs, we decided to perform splenectomy. This was followed by spectacular recovery. No relapse has been observed in four years after the operation. The patient is working full time at present.

In a second case (unpublished) the portal of entry could not have been determined with certainty, for both purulent panophthalmitis and urethral dilatation preceded the bacterial endocarditis. Blood cultures, positive for Ps. aeruginosa, were obtained after enucleation of the diseased eye. Administration of polymyxin B led, however, to recovery without relapse for two years. Mitral regurgitation was the original valvular lesion in this case, too.

Neomycin was used with excellent result by Kenoyer and co-workers (*Am. J. Med.* 13:108 [July] 1952); however, their case is not strictly comparable to ours, since endocarditis of one week's duration after mitral surgery can be described only as acute. We conclude that the prognosis of this condition, the frequency of which is increasing in the present era of antibiotics, though serious, is not to be considered with undue pessimism.

George Gottsegen, M.D.
National Institute of Cardiology
Nagyvarad–ter 1
Budapest IX, Hungary

CANCER SURVIVAL

To the Editor:—We are conducting a pilot study at the mental hygiene clinic of the Veterans Administration using motivational research techniques to determine why intelligent people (including physicians) do not have routine cancer checks. One factor which emerges is that "one out of four" is usually read, "one out of four others, not me!" The Public Education Review Committee of the American Cancer Society recommended in 1956 that primary emphasis be placed an annual health checkup examinations for adults, however well they may feel, and continued but secondary emphasis on danger signals. It has been observed that the society's three-legged stool—research, service, and education—has one decidedly short leg, and that short leg is education. We have evidence that some physicians give little or no support for the short leg. Unless we have routine cancer examinations we will continue to operate on late cancer. Every physician has a potential cancer detection unit in his own examination room—let him use it!

Herbert C. Archibald, M.D.
1305 Franklin St.
Oakland 12, Calif.

THE LEISURE CORNER

WOOD CARVING

For at least 5,000 years men have carved various objects, ornaments, and figures from wood. Wood carving as an art is mentioned in the Bible, and historical accounts from very early times tell of Egyptian and Grecian wood carvings. The earliest wood artifacts were probably the small masks and statuettes of gods and goddesses of African Negro tribes. The wood carvers of the Middle Ages helped to decorate the great cathedrals. One of the outstanding craftsmen was Grinling Gibbons (1648-1720), who carved the stalls of the Saint Paul's Cathedral in London. After the middle of the 1800's, wood carving attracted less interest. But in Switzerland wood carving is still a regular occupation. Today, fine wood carving is done by a number of American and European artists, and it has become an interesting hobby.

As a hobby, wood carving exerts a rewarding therapeutic effect, for there is an astonishing tonic quality to the feel of a chisel against a block of wood and in the contest between one's mastery of a tool and the wilfulness of its grain. Wood carving, for a time at least, can make the busy physician oblivious to his many medical responsibilities. But short notice is required for putting the hobby into action; the project at hand is clamped to a workbench, you pick up the chisel, and then go on from there.

One of the charms of wood carving—and this applies to most crafts followed as hobbies—is that there are no discouraging standards of perfection against which you must compete. What you do you do sheerly for your own approval, enjoying to the utmost your small triumphs and accomplishments. These invariably yield a sense of satisfaction out of all proportion to the results achieved. The reward comes not from being a professional wood carver but in bettering your own skill in wood carving as a hobby. Actually, wood carving brings delight and surprises all along the road from novice to expert. To succeed, one needs only a certain amount of spare time, an interest in the project undertaken, a few tools, patience, and the willingness to proceed. Any person who can sharpen a pencil can learn to carve wood.

Dexterity with tools is undoubtedly of great value; more important, however, is the discovery that it is possible to shape a rough piece of wood into any form desired. This is precisely the goal of the wood carver. In short, the purpose of carving wood is to make the surface more interesting by means of imposing a graceful pattern and inducing an intriguing play of light and shadow. In wood carving, certain obstacles have to be recognized, for example, the resistance and peculiarities of wood. The easiest woods for the wood carver to cut and finish are white pine, basswood, black walnut, and mahogany. There are other woods, of course, and these are beech, oak, holly, redwood, and sycamore. The wood should be well seasoned and possess a smooth texture and color. An accomplished wood carver will frequently use wood burls of knotted wood for an attractive surface pattern.

The exquisite wood carvings made during the Middle Ages were executed by means of crude tools. Today's hobbyists have available tools of the finest steel, highly finished, and in such a wide range of variety as to make a choice a simple matter. In general, wood carving need not require many tools. One or two very sharp knives and a sharp chisel will do for the beginner. A good wood carving knife is a tool of great utility, especially for making greater stop cuts deeper at one end than at the other. Chisels have straight cutting edges and are suited for cutting straight lines and carving flat planes; they are also useful for blocking out convex round projections, but they are not adapted for scooping out hollow curved forms. A penknife often makes the best tool for carving small objects. For larger pieces, a jackknife or hunting knife is required. The blades must be made of good steel and should be kept as sharp as a razor if good results are to be achieved. In addition, as the hobbyist progresses with wood carving, gauges are most useful, especially for cutting the various curvatures in outline and surface of a design. A dealer will furnish a chart showing the sweeps of various gauges, from which you can select the blade you want. Finally, although a scraper is highly important to a carpenter, it is useful in wood carving for removing rough surfaces and projections and for removing a design drawn on a piece of wood.

The novitiate wood carver should practice his strokes on a piece of soft wood about one-fourth to three-eighths of an inch in thickness. An outline of a simple design should be drawn on the surface of the wood; the figure then is carved out, stroke by stroke. The second piece may be of thicker wood, with the edges rounded off. After this, a simple figure can be carved in full. To do this, the hobbyist selects or cuts a block of wood according to the size needed. He draws a separate view of the figure on each side in outline, then he carves out the front and back and then the sides. Simple lines cut with single strokes are best. The sharp edges of the stroke are left to help show the planes of the figure.

Woods of all kinds have a fiber traversing their substance and a grain made of layers of annual growth. Cuts made at random are apt to split and splinter wood. To make a clean, precise shape, the carver should take out clean chips, and to accomplish this he must first sever the grain. If you watch a wood-chopper fell a tree, you will notice he scatters clean-cut chips, each one made by two strokes of his axe—the first horizontal and the second slanting downward. Similarly, if an expert whittler is observed, he, too, expends two cuts for every chip. Indeed, the wood-chopper and the whittler are applying basic rules of wood carving. In this connection, there are three basic rules: first, sever the grain of wood in the beginning, then cut out a clean chip; second, consider the grain of wood and make the slice (the second stroke) in a direction to bring the tool out clean, so that there is no splitting; and third, never place the left hand in front of a tool, for tools are sharp and they may split or slip through the wood, gashing the hand that is in the way. When working with a mallet, grab and guide the blade with the left hand, while striking with the right.

The question frequently arises in the mind of the beginner as to what to carve and how to obtain designs. The novitiate would do well to follow traditional methods at first, obtaining patterns that are established and modifying them to suit his own individual taste. It certainly is not necessary to purchase expensive pieces of lumber in the early stages of one's evolution as an expert wood carver. Every lumber yard has scraps of wood which can be bought very cheaply by the sackful. A no. 3 grade of wood is adequate, since it can be used for practice at first, and the number of knotholes present make little difference in the practice sessions.

During the earliest phases of your wood carving experiences you will frequently find yourself laughing at your own mistakes. But as you become proficient, you will soon find yourself completely absorbed in a hobby that will give you no end of pleasure. Soon, you will find considerable gratification in the results you obtain, and much joy in creating objects through your own dexterity.

BUSINESS PRACTICE

This is the eighth in a series of excerpts from the brochure on the Business Side of Medical Practice, prepared by the American Medical Association in cooperation with the Sears-Roebuck Foundation.

THE BUSINESS OF A PRACTICE

Though a physician is attracted to medicine because he likes to help people and is a humanitarian at heart, he soon realizes that to continue practicing he must charge and collect for his services. If he starts practicing with the right philosophies about money and with a sound system for handling the income from his practice, he learns to put the financial side of medicine into its proper perspective—in a secondary but important role.

How to Charge

A physician establishing practice has to decide what his charges for services will be. Burdened with the bills he incurred in setting up his office, it would be understandable if the doctor set out to make money fast. Such commercialism in the long run does not pay, for it affects the opinions that his patients, his colleagues, and the entire community develop about him. In fee-setting, his first question should be: "What is a fair fee?" Naturally, fees vary from community to community, and there is some differentiation between physicians in specialties.

The best way to find out what average fees are in a town is to check with the county medical society and with other physicians. Deciding what to charge involves weighing several factors: the fees charged by other doctors, the particular specialty and experience of the physician himself, and the cost of running his own office. He does not want to charge fees that are too high—nor does he want to charge too little. Fees that are too low do not win respect for a physician's services.

Years ago the medical profession followed the philosophy of charging the well-to-do patients higher fees to offset either low fees or free care for the poor. Today, because so many persons have a substantial part of their medical care costs paid for through insurance or some other mechanism, this philosophy is becoming a thing of the past. However, every physician is bound by his profession's code of ethics to provide medical care to anyone who needs it, regardless of cost, and a new physician accepts his responsibility for giving a certain amount of free services. Such care should be limited to those persons who for good reasons are financially unable to meet their medical bills. To those who can pay, the physician should make every attempt to charge a fair fee—and to give the best medical service possible per medical dollar.

Explaining Medical Costs.—When a patient understands what he is paying for and is satisfied with the services he received, the physician rarely has difficulty in obtaining his fee. Traditionally, the medical profession has shied away from discussing fees, feeling that the financial aspects of medicine were unpleasant and the less said, the better. But today, the American public is conditioned to itemized bills, regular billing, and budget plans for paying for goods and services. People expect doctors to adopt the same business principles in handling medical fees.

When a physician frankly discusses fees in advance with his patients, misconceptions about overcharging and fee frictions are minimized. A doctor or his patient may be reluctant to bring up the subject of fees. If the patient does not ask and a larger fee than expected is charged, it is advisable for the doctor to broach the subject. Telling a patient to "worry about the cost later" is not doing the patient a service. He wants to know approximately how much his surgery or treatment will cost so that he can plan or budget ahead for it. Several ways to encourage fee discussions are suggested for new physicians. A physician can display a fee discussion plaque, available for $1.00 from the A. M. A., which encourages talks about charges to achieve mutual understanding.

Keeping Track of Income and Expenditures

A physician, like any businessman, must be able to evaluate his own financial situation at any given time by checking his records. He has to know how much he has earned, how much he has collected, what he has spent, and what he owes. He should be able to compare this month's income with last month's, this year's with last year's, in order to evaluate his progress. Furthermore, the federal government requires increasingly deailed, complete financial records for income tax purposes. The doctor must not only keep a full record of what he earns but itemize his expenses so that he can explain them. He also must keep a number of government records for any employees he may have. For this reason he needs a good financial records system.

A doctor's bookekeeping system need not be complicated. Some of the most efficient systems are the simplest ones. No one system will meet the needs of every doctor. There are many excellent systems in use, and a physician establishing his own records system probably will want to talk over various possibilities with professional management advisers or others familiar with the medical bookkeeping field.

Elements of a Good Financial Records System.—Though the forms used may vary, there are four elements which should be a part of any good financial records system: (1) a daily listing of payments and charges, (2) individual records of patients' charges and payments, (3) a permanent ledger into which daily financial information is placed along with records of income and expenditures, with a detailed description of money disbursed, and (4) a petty cash system within the office for paying small bills from day to day.

Daily Record: In every office the doctor or his assistant must carefully record the names of every patient, the amount charged for medical service, and any money collected. This daily record, which sometimes is combined with a list of appointments for the day, when totaled at night should give the following information: the amount of cash collected, the amount of money received by check, and the amount charged to patients who have not paid and must be billed later. The total cash collected and the money received by check should be identical with the figures for these items shown on the day sheet.

Individual Patients' Records: Information regarding patients' charges and payments should be maintained in a separate file, which in bookkeeping jargon is termed the "accounts receivable records." This data, taken from the daily sheet, can be kept in a ledger or on account cards. It should not be placed on a patient's medical record, as the disadvantage of combining medical and financial records was pointed out earlier.

Patients' account records usually are quite simple, containing a column for entering the charge or fee for services, a column for entering the amount the patient has paid on account, and a column in which the balance appears. General information, including the patient's name, age, business and home address, and the name of the person responsible for the bill, usually also appears at the top of the card. (Often a child is the patient, but the parent is the individual responsible for the bill.)

In the process of transferring information about charges and payments from the daily record to the patient's individual record card, great care should be taken to make sure errors do not occur. Nothing irritates a patient more than to be billed for a service he paid for weeks before. The individual cards are used to make up the patients' bills at the end of each month, or at whatever interval the physician sends out statements.

Permanent Ledger: The daily sheet and the patients' individual financial cards are the working elements of a physician's bookkeeping system. These are used in keeping the permanent record of all income and expenditures. It is these permanent records which are used to analyze the doctor's financial status over a period of time, to compute his income tax, and to perpetuate his practice.

Some bookkeeping systems have forms similar to the daily record of patients' charges and payments on which the doctor or his aide keep track of disbursements. For example, if the doctor pays out two or three dollars for gasoline, this is listed, along with any expenditures for stationery, for medical supplies, or for paying routine office bills. These payments are listed and placed in proper columns, such as personal, maintenance, office expense, and so forth.

The totals from the daily record sheet and the totals from daily disbursement records are transferred to the permanent ledger each day, so that at the end of each month complete totals on all income and expenditures can be tallied. From this information a monthly statement of income, expenditures, net gain or loss, and other evaluating information can be prepared. Over a period of 12 months, this forms the basis for a yearly statement.

Typical items on the disbursement record include "expendables" (drugs, medical and laboratory supplies, office supplies); "maintenance" (rent, utilities, laundry, office upkeep); "capital outlay" (major equipment); "salaries"; "automobile"; "dues" (professional only); "subscriptions" (professional journals); "insurance" (medical or dental liability, office and equipment, fire and theft, Workmen's Compensation); "taxes" (from profession only); "entertainment" (minor donations, professional entertainment); "depreciation"; "bad debts"; and "collection fees" (paid out to agencies for fees). If a doctor receives any income from sources other than the practice of medicine, this should be listed as "personal" and itemized. Any expenses for living that he would incur regardless of his profession must be recorded as "personal."

Keeping accurate, detailed records pays off. It keeps the physician informed about his own financial picture and it simplifies preparation of tax and other necessary records. The establishment of a sound system and regular attention to that system is the most efficient means of handling these business details.

Petty Cash: Every office requires a little cash on hand to pay out for small items, but major bills should be paid by check. Usually $20 or $25 is ample to keep in the office for "petty cash" expenditures. Keep such funds in a safe place, preferably in a drawer that can be locked. In most offices an established sum is set up on a monthly basis and balanced each month. A small, triple-column account book should be kept with the petty cash in which debits or the amount paid, credit or the amount received, and the balance on hand can be indicated. No money should be taken out unless the amount and the reason for taking it along with the date are shown. Receipts or vouchers for each expenditure also can be used and are good business procedure. To replenish the petty cash, a check can be made out payable to petty cash and the money secured, preferably in small bills and change. This check should be made out for the amount actually spent, so that the petty cash fund returns to its original balance each time it is replenished.

Recording Money Obtained Out of the Office.—Sometimes a doctor is paid in cash or by check while he makes a house call or when he encounters a patient on the street. It is too easy to put the money in your pocket and forget about it. When the bills are made out, the payment has not been recorded and the patient receives a bill. This does not make for harmonious relations between doctor and patient. It is wise for a physician to carry a little booklet in his pocket so that when he makes house calls he can enter the name of the patient, charges and payments. This information then can be added to the daily sheet at the end of the day, and the money deposited as a part of the day's receipts. Don't use such payments as "spending money" or the records will never be straight.

General Bookkeeping Suggestions

The physician should maintain records on his personal affairs. These records include his property ledger in which he enters information about his personal property, real estate, securities, professional travel and other tax deductible expenses and honorariums. He will also want to set up separate files for listing his insurance and other personal financial information.

He must maintain banking accounts, and it is probably simpler to keep separate accounts for his practice and his personal affairs. All deposits from fees and all withdrawals for professional expenditures he handles through the professional account. Ideally, a deposit is made daily for each day's receipts with the deposit slip made up from the information on the day sheet.

The time will come when the physician will wish to consider placing his more valuable papers in a safe or safety deposit box. Records best kept in a safe include such vital documents as birth, marriage and divorce records, wills, passports, diplomas, business contracts, deeds or leases, investments and mortgages, property inventory lists, and insurance policies.

Other Filing Suggestions

In addition to medical and financial records, the physician must maintain a correspondence file into which all letters he receives and answers should go. He will decide himself whether to separate correspondence into another file or to place letters about patients' medical conditions with their medical records and letters regarding financial matters with financial records on patients. Whatever system he selects, he should set it up in an efficient manner, then adhere to the pattern established.

In all office filing systems, it is important to separate outdated material to avoid cramming of cabinets. A system for eliminating temporarily important information (letters of acknowledgment, duplicate forms and reports, and orders) should be established. In some offices, a "destruction date" is penciled at the top of the page on all correspondence routed to file and the cabinets regularly checked to eliminate outdated material. When destroying material which once was considered of permanent value, list each item on a single sheet, then have someone witness the destruction. This is proof of disposal in case your action later is questioned.

How Long Should Records Be Kept?—Legally, a physician's records belong to him and to his widow should he die. Thus, the physician has the legal right to destroy his records at any time. In general, professional records should be kept as long as they are of value to the patient in connection with his medical treatment and until the statute of limitations has run out on the various legal actions with which a physician might be faced.

Narcotics records, for example, must be kept a specified period of time under federal or state law —generally for two years. A record that may be useful as evidence in a pending criminal case should be preserved until the case is concluded. This same general rule also applies in civil court actions, in cases where disposition of a will or age of consent may be significant. That is why doctors usually preserve birth and death certificates and autopsy and police reports. Some doctors also arrange for disposition of patients' records in event of their death, usually by a colleague, to spare their widows this responsibility.

Rights to Records.—Though his records belong to him, a physician who moves his practice to a distant location may wish to provide his patients with x-ray interpretations or copies of other reports if they may be helpful in the future.

He need not give out medical records except when officially requested to do so by the proper law-enforcing bodies or when he is referring a case to a colleague for further treatment. In instances of referrals, the doctor decides whether to send the complete file on the patient or transmit only pertinent data, answering specific questions the other physician asks. The governing point is the welfare of the patient.

Remaining Personal Records.—Retention of personal records is a decision to be made by the physician himself. He must keep in mind the possibility that someday he may be questioned regarding a possible malpractice action. Consequently, he should keep professional reports beyond their apparent usefulness, to support his arguments and substantiate his claims should this someday become necessary. An attorney should be consulted concerning the period of time in which suit may be brought for malpractice or for breach of contract in the state in which the physician practices.

Stocks, bonds, titles, mortgages, contracts, insurance, and records bearing on income tax should be kept for at least three years. It is advisable to seek competent advice on such matters and request it in writing. Although the government does not normally indict for tax deficiencies more than three years after the questioned return is filed, it can bring suit at any time in a civil action to collect alleged back taxes, plus interest and penalties.

MEDICAL FILM REVIEWS

The Operating Microscope in Otologic Surgery: 16 mm., color, silent, showing time 23 minutes. Prepared in 1958 by George E. Shambaugh Jr., M.D., Eugene L. Derlacki, M.D., and Wiley H. Harrison, M.D., Chicago. Procurable on loan or purchase ($250) from George E. Shambaugh Jr., M.D., 55 E. Washington St., Chicago 2.

This film shows the most essential steps in the surgical technique of removing the epidermis from the tympanic membrane in preparation for application of a skin graft to repair a perforation or defect. The technique of this procedure is beautifully shown. Restoration of the articulation of the incus and stapes, in a case in which disarticulation had been accidentally done at a previous operation, is included. The hearing returned to normal after restoration. This is of value chiefly as a demonstration of unusual cause for hearing loss and its repair. The technique is not a standard one and is perhaps less important than the demonstration of the pathology. The technique of one method of preparation of the fenestra at the fenestration operation as devised by Lempert is shown. This is the most perfect demonstration of this technique that has yet been shown by motion pictures. The technique of the stapes mobilization in cases of otosclerotic ankylosis is very clearly demonstrated. This is also the best demonstration of technique that has yet been accomplished by motion pictures. All of these procedures are shown more clearly than is possible to demonstrate by direct visualization through the microscope. The film does not attempt to include detailed information such as diagnosis. Because of the excellence of the photography and visualization, this film is highly recommended for its teaching value to specialists who are either learning or doing these operative procedures.

Femoral Artery Bypass Graft with Crimped Teflon: 16 mm., color, sound, showing time 14 minutes. Prepared by W. Sterling Edwards, M.D., and Richard A. Dillard, M.D., Birmingham, Ala. Produced in 1958 by the Department of Surgery, Veterans Administration Hospital and Medical College of Alabama, Birmingham. Procurable on loan from Central Office Film Library, Veterans Administration, Washington 25, D. C.

The purpose of this film is to demonstrate the use of crimped Teflon prosthesis for a femoral bypass graft in a 71-year-old man who had had a left thigh amputation two years previously for gangrene of the left foot. It is a clearcut demonstration of the standard procedure of femoral bypass. The authors use a new experimental material, namely, crimped Teflon, but the advantages of this material over the existing ones are not mentioned. The narration is crisp and to the point. The photography is excellent and all irrelevant material has been deleted. The film should be useful for postgraduate teaching of surgical residents and surgeons interested in vascular surgery. If the exact indications of the procedure were outlined, the film might be useful for the general medical profession as a possible means of restoring peripheral arterial circulation.

Bence-Jones Protein Test: 16 mm., color, sound, showing time 5 minutes. Produced in 1957 by the Medical Illustration Service, Veterans Administration, West Side Hospital, Chicago. Procurable on loan from Veterans Administration, Central Office Film Library, Washington 25, D. C.

The purpose of this film is to demonstrate a positive Bence-Jones protein test. Although routinely performed in most clinical laboratories, the test is rarely positive. The film shows a dramatically positive Bence-Jones test applied to urine containing almost pure Bence-Jones albumose. It tells the story of this interesting phenomenon better and more convincingly than thousands of words would do. The pictorial demonstration of the changes as they occur when the temperature rises to the critical level and beyond must be revealing to the uninitiated and is fascinating even to the expert. Technically, the film is satisfactory and the narration is well done. It will be useful mainly in teaching medical technologists and medical students and is worth showing to physicians in general.

NEW FILM ADDED TO A. M. A. MOTION PICTURE LIBRARY

Intracranial Aneurysms: 16 mm., color, sound, showing time 43 minutes. Prepared in 1956 by Professor Rudolf Peter and Dr. Rudolf Malec, Prague, Czechoslovakia, for the Department of Popular and Scientific Films. Procurable on loan (service charge $3) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film on the surgical treatment of intracranial aneurysms presents the anatomic and pathological background of these lesions and shows the technique employed in their diagnosis, evaluation, and subsequent surgical treatment. The subject is based on an experience of about six years with 48 patients. Examples of the surgical treatment of intracranial arteriovenous malformations are included also. This is a beautifully dramatic and scientifically correct presentation of a subject on which the authors are authorities. The animation is exceedingly good. The film is especially recommended for residents, medical students, and general surgeons. It would also be of interest to neurosurgeons because of the special instruments and the statistics presented.

MEDICAL LITERATURE ABSTRACTS

SURGERY

Superior Vena Caval Obstruction. R. Allansmith and V. Richards. Am. J. Surg. 96:353-359 (Sept.) 1958 [New York].

The work done in the experimental laboratory has increased our knowledge of the clinical picture associated with superior vena caval obstruction. The increased venous pressure causes dilation of the veins over the upper half of the body. There is respiratory distress, increased by the edema of the neck and glottis, plus pleural effusions, as well as by the increase in the carbon dioxide content of the blood in the respiratory center. Headache and somnolence are caused by congestion of the brain, and there may be syncope and even Jacksonian convulsions from cerebral thrombosis. The cerebrospinal fluid pressure is elevated. The eyes bulge, and the lids are edematous. All the symptoms of this condition are exaggerated by bending forward, and many patients sleep sitting up, since they become dyspneic with recumbency.

Roentgenologic examination usually reveals a widened mediastinal shadow. A tumor or aneurysm may be obvious with the use of routine films, or tomograms may be required to visualize a mass. Phlebograms usually reveal a maze of collateral vessels and a block at the thoracic outlet. If the obstruction includes the azygos vein, and it usually does, the blood flow in the remainder of the azygos system and in the superficial and deep collateral veins, carrying blood to the femoral and iliac veins or to other veins communicating with the inferior vena cava, is prominent in a caudal direction. In the few instances in which the occlusion is above the azygos vein, a prominent venous plexus develops over the sternum, seeking the perforating branches of the internal mammary vein and thence to the azygos veins via the intercostals. If the superior vena cava is occluded below the azygos vein, or if both the superior vena cava and the azygos systems are obstructed, the blood from the upper half of the body must take a very circuitous route in order to return to the heart through the inferior vena cava. Venous pressure increases with exercise if a block is present, whereas elevated venous pressures caused by heart failure do not show a significant increase with exercise. If a tourniquet is applied to the chest, constricting the superficial thoracoabdominal vessels, and the venous pressure rises with inspiration, the block is distal to the azygos vein.

The prognosis depends upon: (1) the cause of the obstruction; (2) the location and rate of obstruction; and (3) the adequacy of the collateral circulation which develops. Mediastinal tumor is still the single most common causative factor. The over-all mortality from severe obstructions is approximately 70 to 80%, regardless of cause. The nonsurgical treatment includes the use of antibiotics, chemotherapy, and x-ray therapy, while the surgical treatment consists of phlebotomy, mediastinal decompression, and vascular grafting. In the series presented, 21 patients have had almost immediate relief of symptoms after surgical procedures designed to relieve the obstruction and establish an adequate shunt. Arterial homografts (preserved) were used in 10 patients, arterial heterografts (preserved) in 1, vein autografts in 7, and prostheses (crimped nylon) in 1; no grafts were employed in the remaining 2 patients. The right auricular appendage was the site of the shunt to the heart in 10 patients, and the superior vena cava in 8. At the present time the optimal treatment of superior vena caval obstruction, not due to a malignant neoplasm but to a benign fibrotic process, is the insertion of a homograft between the proximal patent caval or innominate veins and the intrapericardial superior vena cava, if patent, or the right auricle.

The Pathogenesis and Treatment of Primary Hydroceles in Infancy and Childhood. D. G. McKay, R. Fowler Jr., and J. S. Barnett. Australian & New Zealand J. Surg. 28:1-11 (Aug.) 1958 [Melbourne].

The authors report on 100 infants and children with hydrocele who were treated at 2 children's hospitals in Melbourne and Adelaide, Australia. A wide anatomic variety of the hydrocele sac was observed, with all intervening gradations between the simplest communicating type of sac and the

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

most complex noncommunicating and multiple saccular formations. Whether communicating or noncommunicating, such hydroceles were always associated with an abnormal patency of at least the proximal part of the processus vaginalis testis. From the succession of types observed, the natural history of evolution of the various forms was considered as beginning with simple patency of the vaginal process and its gradual distention by peritoneal fluid. If delayed spontaneous obliteration of the entire vaginal process should occur, then spontaneous cure will result and the fluid will be reabsorbed. But if a fine vaginal process should become obliterated only at its junction with the hydrocele, the next evolutionary change would be the dilatation of that portion of the process immediately above the distal sac. When the communicating process is wide and has a communication with a distal sac, progressive enlargement of the hydrocele might take place upwards into the cavity of the hernial sac above, producing a rather bizarre "inner sleeve" arrangement which had not been reported before.

These findings suggested the concept of a congenital origin of the hydrocele, and this concept was supported by additional evidence. The right-sided preponderance, typical of hernias and undescended testes, was likewise found for these hydroceles. A history was usually elicited, even in the apparently noncommunicating cases, of intermittent variation in the size of the hydrocele at some stage in its life history. The fluid from both communicating and noncommunicating hydroceles was microscopically and chemically indistinguishable from peritoneal fluid. Surgical treatment, therefore, was directed to the vaginal process alone. Simple herniotomy with transfixion, ligation, and division of any patent derivative or strand of the vaginal process was performed. The hydrocele was emptied by simple aspiration or minimal stab incision. Imprisoned hydrocele fluid was shown to be reabsorbed from both communicating and noncommunicating hydroceles after simple operative ablation of a patent funicular process. If the hydrocele sac was left behind, emptied of its fluid, reaccumulation of such hydrocele fluid did not occur after severance of the funicular process or strand. Of the 100 children operated on, 6 had had recurrences after previous orthodox surgery; these recurrences were always associated with a fine patent vaginal process which had been overlooked at the original operation. Severance of this fine process cured the condition. The more extensive interference with the hydrocele sac inherent in orthodox surgical procedures is therefore unnecessary. In infants, the management of hydroceles should be expectant because of the tendency to spontaneous cure.

NEUROLOGY & PSYCHIATRY

The Uveo-Encephalitic Syndrome or Vogt-Koyanagi-Harada Disease. H. Reed, A. Lindsay, J. L. Silversides and others. Canad. M. A. J. 79:451-459 (Sept. 15) 1958 [Toronto].

The uveo-encephalitic syndrome is characterized by uveitis, depigmentation of skin and hair, and cerebral manifestations. It has long been recognized by ophthalmologists, but it may present a diagnostic problem to general physicians, neurologists, neurosurgeons, and dermatologists. The authors review the literature, report 5 more cases, and discuss the etiology of the condition. Although Vogt is usually given credit for being the first to describe this syndrome in 1906, it was described by Hutchinson in 1892. Koyanagi wrote an account of this disease in 1929, reviewing 12 cases from the literature and presenting 4 of his own. He described the clinical picture of headache, fever, bilateral uveitis, dysacousia, vitiligo, poliosis, and alopecia. After Koyanagi's publication the condition was known as the Vogt-Koyanagi disease. In 1926 Harada described 5 cases characterized by bilateral posterior uveitis with inferior exudative retinal detachments. For nearly two decades it was considered that the Vogt-Koyanagi disease and the Harada disease were 2 separate entities, the difference being that in the former the uveitis was anterior in situation and no detachment occurred, while in the latter the uveitis was posterior and was accompanied by retinal detachment; but this distinction is not justified.

Great variations in the severity of the clinical picture may occur, and incomplete manifestations of the disease are probably common. It has been pointed out that bilateral uveitis with pleocytosis of the cerebrospinal fluid is not uncommon and that such cases should probably be considered as "formes frustes" of this disease. The 5 cases presented here show the great variations in severity and in the clinical picture which may be encountered. The first patient exhibited mild manifestations of the disease. The second patient had retinal detachment in one eye only. His case was unusual in that a severe encephalitis developed, which resulted in diabetes insipidus and a permanent psychosis. The third patient had a condition typical of the picture described by Harada with bilateral retinal detachments. The fourth patient illustrates an unusual mode of onset because recurrent uveitis preceded the neurological signs. It is interesting that, whereas the ocular manifestations failed to respond to corticosteroids, the neurological lesions rapidly responded to a dose of Meticorten which was more than double the previous dose. In the fifth patient the disorder presented as a bilateral retrobulbar neuritis and then developed into an apparently typical Harada pattern with recovery. Two theories concerning the cause of this disease have been advanced, namely, that it is (1) a virus infection and (2) an allergy to uveal pigment. At the present time the weight of evidence suggests a virus as being the cause. No effective treatment is known, except that some reports suggest that corticosteroids might be of value. Wider recognition of the disease is important, so that unnecessary craniotomies will be avoided, because severe cases may resemble a rapidly expanding intracranial space-occupying lesion.

Deficiency of Vitamin B-Complex Causing Psychiatric Symptoms of Atypical Endogenous Depression. E. J. W. Keuter. Nederl. tijdschr. geneesk. 102:1501-1503 (Aug. 2) 1958 (In Dutch) [Amsterdam].

The author presents the history of a 40-year-old woman who was referred to a psychiatric clinic because of severe depression. Pernicious anemia was thought of, because the diameter of the erythrocytes was enlarged, and achylia gastrica was detected, but sternal puncture did not corroborate this diagnosis. Since the patient also had hypochromia, she was treated with iron and hydrochloric acid. The psychiatric picture, which had existed for 17 years, remained uninfluenced by electroshock and chlorpromazine treatments. Later, a pellagra-like syndrome was recognized, and it was found that the vitamin B_1 content of the blood was low. The administration of vitamin B complex caused disappearance of psychiatric symptoms, so that the patient could be discharged from the clinic.

GYNECOLOGY & OBSTETRICS

Myopathy of the Climacteric (Menopausal Muscular Dystrophy). H. E. Kaeser. Schweiz. med. Wchnschr. 88:849-855 (Aug. 30) 1958 (In German) [Basel, Switzerland].

The author groups the climacteric or menopausal form of muscular dystrophy with the degenerative myopathies, which presumably are caused by metabolic or endocrine disturbances, although the relationship has not been definitely established. In a survey tabulation of myopathies and myositides, 3 main groups are differentiated: (1) hereditary forms; (2) myopathies resulting from metabolic disturbances; and (3) chronic myositides. The second group, in which the author includes menopausal muscular dystrophy, also embraces the myopathies that accompany the following disorders: hyperthyroidism, hypothyroidism, liver diseases, pancreatic and adrenocortical insufficiencies, and vitamin E deficiencies.

The author presents 3 established and 2 doubtful cases of climacteric myopathy. He points out that, after early reports by Nevin and Bramwell in 1936 and 1922, respectively, Shy and McEachern i 1950 and 1951 presented several papers on a disorder which they designated as "menopausal muscular dystrophy." The disorder is characterized b weakness in the musculature of the pelvic an shoulder girdles; it occurs chiefly in women durin and after the menopause. Muscular atrophy is no always evident, because the muscles are covered b fat tissue. The involved muscles are soft, the dee reflexes are normal in the early stages, but late they become weaker or completely abolished. Th weakness appears first in the muscles of the pelvi girdle and later in a milder degree in those of th shoulder girdle. The women usually complain of increasing weakness while walking. When ascendin the stairs, they have to pull themselves up b grasping the handrail. They cannot rise from chair without aid, they fall without apparent reason, and later, when the arms become involve they need help in dressing themselves. Other peopl notice the waddling walk and the increasing helplessness.

On biopsy, in the series examined, the muscle were pale. Histological examination showed spott degeneration of the muscle fibers. Endocrine disorders could not be established. Electromyographi and transaminase studies were made. During th active phase of the myopathy the glutamic-oxaloacetic transaminase was increased. With the administration of prednisone an impressive and lasting clinical improvement could be observed in of 4 patients, with normalization of the transaminase. There is no evidence as to whether menopausal muscular dystrophy is related to a myopath or a chronic polymyositis.

Meigs's Syndrome. P. Stavem. Tidsskr. norske læg for. 78:703-704 (Aug. 1) 1958 (In Norwegian) [Oslo

In most cases of Meigs's syndrome the pelvi tumor is the size of a child's head or larger, bu tumors smaller than a hen's egg have been see According to Meigs, the term Meigs's syndrom should be used only in cases in which the tum consists mainly of fibrous tissue, as ascites an hydrothorax are fairly frequent only in fibrous ovarian tumors. Sometimes there is marked hydrothora which reaccumulates rapidly after tapping, whil ascites is scanty and established on laparotom The fluid in the pleural cavity is like that in th peritoneal cavity and is usually a transudat though sometimes an exudate is found, with protei content of more than 3% and positive Rivalta tes In case of rapidly reaccumulating hydrothorax an pelvic tumor in a woman of any age, the possibilit of Meigs's syndrome should be considered. All th symptoms will disappear as by magic on remov of the tumor. Meigs's syndrome is not to be excluded because ascites cannot be demonstrated clinically or because ascites and pleural fluid resemble an exudate more than a transudate. A large, firm ovarian tumor may occasionally be mistaken for a fibromyoma of the uterus. In the case reported, in a woman, aged 37 years, admitted with a right-sided pleural effusion, there was rapid reaccumulation after tapping. The effusion disappeared within 2 weeks after removal of a large fibroma of the ovary.

Preservation of Ovarian Function in Combined Treatment of Early Cancer of the Cervix Uteri in Young Women. C. Krebs and N. Blixenkrone-Møller. Ugesk. læger 120:1012-1015 (July 31) 1958 (In Danish) [Copenhagen].

At the Radium Station in Aarhus during the one-year period 1949-1950, an attempt was made to prevent the grave complications of premature climacteric due to irradiation in young women with cancer of the neck of the uterus in early stage by lifting one ovary or both ovaries to a distance of at least 12 cm. from the tumor before radium treatment. Six of the 8 patients who received only radium treatment after the intervention have preserved ovarian function. The material seems to show (1) that neither lifting of the ovaries as such nor preserved ovarian function has any adverse effect on the result of radium treatment of cancer of the neck of the uterus, (2) that it is not possible by the operation to attain preserved ovarian function if combined radium-roentgen-ray treatment is applied, and (3) that after the intervention most of the patients given only radium treatment preserve their ovarian function. The authors intend to resume this method of treatment in patients under 40 years of age with cancer of the neck of the uterus in stages 1 and 2. If laparotomy shows the disease to be more advanced than indicated by the clinical examination, the intended intervention must be given up, as in such cases intensive radium-roentgen-ray treatment is necessary.

Precordial Murmurs During Pregnancy and Lactation. J. W. Hurst, J. Staton and D. Hubbard. New England J. Med. 259:515-517 (Sept. 11) 1958 [Boston].

A variety of innocent murmurs may develop during pregnancy and are often attributed to heart disease. Some of these murmurs are due to an increase in blood velocity and emanate from the heart itself, whereas others are of extracardiac origin. The precordial murmur in one patient was due to a bruit in a branch of the mammary artery; it persisted after delivery and vanished only upon termination of lactation. The precordial continuous murmur in a second patient originated in the large dilated veins of the breast and could be altered by firm pressure with the stethoscope bell, indicating that the murmur was extracardiac in origin and suggesting that it was related to the vascular engorgement of the breast that occurs during pregnancy.

The Prophylaxis of Iron-Deficiency Anaemia in Pregnancy, D. N. S. Kerr and S. Davidson, Lancet 2:483-488 (Sept. 6) 1958 [London].

The authors studied patients attending the antenatal clinic of the Simpson Memorial Maternity Pavilion in Edinburgh in an attempt to ascertain the incidence of anemia in pregnancy; the effect of season, age, parity, recent pregnancy, and duration of pregnancy on the incidence and degree of anemia; the adequacy of the present diet of Edinburgh mothers; the most suitable forms of iron to be administered orally, if supplements are necessary; and the stage in pregnancy at which iron supplements should be started. It was found that, although severe anemia is rare at the beginning of pregnancy, mild anemia with a hemoglobin level of less than 12.6 Gm. per 100 cc. (or 85%) is common. No correlation was found between incidence of anemia and age, parity, or number of pregnancies within the previous 5 years. An estimate of the average daily dietary intake of iron in pregnant women in Edinburgh suggested that it is slightly less than the 15 mg. usually recommended. The incidence or degree of anemia was not found to correspond closely with the dietary intake of iron.

To obtain information about the potency and toxicity of certain iron preparations, an investigation was undertaken on women attending the antenatal clinic. The 430 women accepted for this investigation were assigned by random selection (choosing a card from a pack) to one of 4 groups. Group A (20%) received ferrous sulfate; group B (20%) received ferrous gluconate; group C (20%) received ferrous gluconate plus ascorbic acid; and group D (40%) formed the control group which received pills containing lactose. As regards gastrointestinal side-effects, no difference was found between ferrous sulfate and ferrous gluconate, given in doses containing 105 mg. of iron daily. Neither preparation caused significantly more unpleasant gastrointestinal symptoms than the other or than the control pills containing lactose. The addition of ascorbic acid to ferrous-gluconate pills did not increase their therapeutic efficacy or reduce their toxic effects. The authors suggest the following scheme of supervision for antenatal patients: routine hemoglobin estimation at the first antenatal visit; iron therapy from the first visit for all patients with an initial hemoglobin level of less than 12.6 Gm. per 100 cc. (85%); and routine administration of elemental iron in a dosage of at least 105 mg. daily to all patients from the 24th week to term. This dosage is provided by one 300-mg. (5-grain) pill of ferrous gluconate 3 times a day. The customary dose of ferrous sulfate is one 180-mg. (3-grain) pill 3 times a day, which provides a much greater amount of elemental iron, namely, 180 mg. per day. The choice of preparation for iron therapy remains controversial. This study suggests that ferrous gluconate may be slightly more efficient than ferrous sulfate (when given in the same dosage in terms of elemental iron—namely, 105 mg. daily).

A Report of 549 Cases of Breast Cancer in Women 35 Years of Age or Younger. N. Treves and A. I. Holleb. Surg. Gynec. & Obst. 107:271-283 (Sept.) 1958 [Chicago].

Five hundred forty-nine women, aged 35 years or less, with cancer of the breast were studied at the Memorial Center for Cancer and Allied Diseases in New York from 1937 through 1949; sarcomas were excluded. Twenty-one patients were between the ages of 19 and 25 years, 124 between 26 and 30 years, and 404 between 31 and 35 years. Eighty-two per cent of the patients were married; and 66% had been pregnant at least once. The incidence of previous gynecologic surgery was only 5.2%, but additional gynecologic disorders were found. Nipple discharge was present in 5.5%, and bloody discharge outnumbered serous discharge. Infiltrating duct carcinoma accounted for 86.6% of the pathological diagnoses. The minimum 5-year clinical cure rate was 30.7%, if all patients other than those known to be free of clinical evidence of recurrent or metastatic cancer 5 years after therapy were classified as failures. The 5-year clinical cure rate in terms of operability was 37.7%. If further selection were made in the group with operable disease, a maximum cure rate of 40.6% could be obtained. These data and a review of the literature indicate that carcinoma of the breast in young women offers a prognosis equal to that in older women.

When axillary lymph node involvement was present, the clinical cure rate was lower than that found in older women, suggesting that the disease may be more lethal in the young patient when regional metastases have occurred. Outer quadrant lesions showed a higher frequency of axillary node metastases than those arising in the inner quadrants; yet, the 5-year clinical cure rate was essentially the same, whether the tumor was located in the inner or the outer half of the breast. When axillary nodes were not involved, cancers located in the outer half of the breast had an 8% better clinical cure rate, compared with the rate for inner half, midline, and central lesions combined. The prognosis was better for patients with the less common type of cancer of the breast, e. g., medullary, comedo, and colloid carcinoma, than for infiltrating duct carcinoma. The incidence of axillary node metastasis was likewise lower. Infiltrating duct carcinoma, grade 2, showed a lower incidence of axillary node metastases and a higher clinical cure rate than grade 3. The higher the level of axillary node involvement, the poorer was the prognosis. Involvement of level 3, however, should not be used as a criterion of inoperability, since 16% of these patients were free of recurrent cancer 5 years or more after radical mastectomy.

Although pregnancy occurring simultaneously with breast cancer had an extremely poor prognosis, the pregnancy should not be utilized as a criterion of inoperability. Pregnancy occurring subsequent to surgical therapy for cancer of the breast appeared to have little influence on prognosis. Definite conclusions concerning the management of pregnancy for women with concurrent cancer of the breast could not be formulated. Likewise, no recommendations could be made regarding management of pregnancy for the woman previously treated for breast cancer. Patients who delayed longer than 6 months before surgical treatment showed a higher incidence of axillary node metastases and a lower clinical cure rate than patients who sought medical care earlier. Postoperative x-ray therapy, regardless of axillary node involvement, had no influence on the clinical cure rates.

Patients considered clinical failures had a median survival of slightly over 2 years. More than two-thirds had died by the end of the third year. There was no postoperative mortality in 399 patients treated by radical mastectomy. When the axillary lymph nodes were uninvolved, prophylactic castration did not affect the clinical cure rates. When the axillary nodes were involved, the 5-year clinical cure rate was 8.3% higher in patients who were castrated. The median survival after therapeutic castration for metastatic cancer of the breast was 9 months. Prophylactic simple mastectomy is not to be recommended even in the presence of a significant familial history of cancer of the breast. The incidence of axillary node metastasis increased proportionately with the size of the tumor. The 5-year cure rate diminished as the size of the tumor increased. Tumor size alone was of significant prognostic import, whether the axillary nodes were involved or not.

These data suggest that certain criteria of operability should be modified. Even young women with axillary node metastases at the highest level have a 16% chance for 5-year clinical cure. Early diagnosis and prompt radical surgery offer the best chance for survival. The maximum opportunity for 5-year clinical cure exists when the primary lesion is small and still localized to the breast. Tumors occurring in the breast during pregnancy should be treated immediately. The previous impressions of poor prognosis for breast cancer in the young woman who is not concurrently pregnant must be supplanted by a more hopeful outlook.

PEDIATRICS

Serious Coxsackie Infection in Infants and Children: Myocarditis, Meningoencephalitis, and Hepatitis. D. M. Hosier and W. A. Newton Jr. A. M. A. J. Dis. Child. 96:251-267 (Sept.) 1958 [Chicago].

There is increasing evidence to show that Coxsackie virus, group B, may cause fatal myocarditis in the neonatal period. This prompted the authors to report on the isolation, during a nonepidemic period, of a Coxsackie, group B, virus in 2 male infants, a female infant, and a 5-year-old boy admitted to hospital in the last 2 years. The 7-week-old boy died of heart failure after a 10-day illness. The autopsy findings consisted of a severe necrotizing inflammation of the myocardium and evidences of cardiac failure elsewhere in the body. Coxsackie virus, group B, type 4, was isolated from the myocardium. A blood culture yielded no growth. The 8-day-old girl was hospitalized with a diagnosis of sepsis showing jaundice and lethargy. A progressive cardiac lesion and a bleeding tendency developed, and the patient died after an illness of about 9 days. Postmortem examination showed extensive focal necrosis of the heart and liver, a mild meningoencephalitis, and focal necrotizing infection of the adrenal. Coxsackie virus, group B, type 4, was isolated from the heart, liver, kidney, and lung. No virus isolation studies were performed on the 6-day-old boy who died on the day of admission. The infant's mother was incubating pleurodynia at the time of delivery and developed the typical clinical findings 24 hours post partum. The infant's myocardium showed no morphologic changes, but diffuse meningoencephalitis, severe focal hepatic necrosis, necrosis of the entire fetal cortex of the adrenal, and focal necrosis of the bone marrow were found at autopsy. It was postulated that the brain and liver changes were produced by a Coxsackie, group B, virus infection. The 5-year-old boy recovered from myocarditis, during the acute phase of which a Coxsackie virus, group B, type 2, was isolated from the stool, and a subsequent rise in homologous serum neutralizing antibodies was demonstrated. Treatment with digitalis and cortisone produced improvement, although cardiac enlargement persisted for 10 months. The patient recovered completely.

According to the literature, the predominant finding in isolated myocarditis has been interstitial inflammation, while necrosis of muscle fibers seemed to predominate in virus myocarditis. These findings induced the authors to review their own observations made between 1951 and 1957 at autopsy on 9 infants and children with myocarditis of varying severity. All but 2 of these patients died during the summer months. The degree of cellular infiltration paralleled the amount of myocardial necrosis in all but one patient. The brain and the liver showed a significant incidence of pathological changes in these children with myocarditis. Four of the 9 showed a mild to severe meningoencephalitis, and 4 had moderate to severe hepatic necrosis, with little or no cellular reaction. The distribution of the necrosis was centrilobular in most, but some showed an irregular pattern of focal necrosis. It is of interest to note, however, that the children who showed the hepatic changes had only mild to moderate changes in the myocardium, while those showing marked myocardial damage showed no liver damage histologically.

Acute Cerebellar Ataxia of Undetermined Origin in Childhood. D. N. Walcher and A. T. Ross. A. M. A. J. Dis. Child. 96:278-283 (Sept.) 1958 [Chicago].

The authors call direct attention to a syndrome of acute cerebellar ataxia which, as a rule, carries an excellent prognosis. Twenty patients with acute cerebellar ataxia, unassociated with any definite cause, 17 of whom were between the ages of 9 months and 4 years and 3 were aged 7 or 8 years, were seen at the Indiana University Medical Center and the Indianapolis General Hospital between 1948 and 1957. Premonitory symptoms of listlessness, drowsiness, fever, vomiting, headache, or a cold were present in 13 children and preceded the ataxia by one or several days. The main feature was the rapid development of ataxia, which always affected the trunk and legs and in some children the arms as well. No abnormalities were detected in the ocular fundi. The hyporeflexia often seen in cerebellar lesions was common. Neurological examination disclosed no clinical evidence of involvement of structures other than the cerebellum. The average period for complete recovery was 5 weeks. As a rule, the children had a single episode of ataxia, but 2 of them had relapses.

It appears that this disease provokes little systemic response to whatever may be the causative agent, a fact in keeping with its benign course. The cause of the disease is undetermined, but it is presumably a viral infection. Tumor of the posterior fossa, acute labyrinthitis, encephalitis, drug intoxication, and hysteria are the most important conditions for which differential diagnosis is required.

Oral Phenoxymethyl Penicillin Therapy in Prophylaxis of Recurrent Rheumatic Fever. S. Kaplan. A. M. A. J. Dis. Child. 96:288-293 (Sept.) 1958 [Chicago].

The author reports the results in a group of 266 patients in whom oral administration of phenoxymethyl penicillin (penicillin V) had been used exclusively as a prophylaxis against recurrences of acute rheumatic fever. All the patients studied had had at least one previous episode of acute rheumatic fever. Throughout the period of study they were treated with one oral dose of phenoxymethyl penicillin, 125 mg. (or 200,000 units) daily. In the event of an intercurrent acute streptococcic infection, the amount of phenoxymethyl penicillin given was increased to 625 mg. (1 million units), administered in divided doses daily for a period of 10 days. There were no instances of toxic effects due to the oral administration of phenoxymethyl penicillin.

There was a recurrence of acute rheumatic fever among only 6 (2.2%) of the 266 patients studied. Three of these patients had had at least 3 episodes of acute rheumatic fever prior to the institution of penicillin phophylaxis. A 4th patient had a recurrence of acute rheumatic fever while still being given steroid therapy. It is possible that the 4 patients were still in an active subclinical phase of rheumatic fever when a clinical recurrence became manifest. One episode of subacute bacterial endocarditis due to a streptococcus organism of the viridans group occurred during the period of penicillin prophylaxis. This infection was cured by larger oral doses of phenoxymethyl penicillin. The low incidence of recurrence of rheumatic fever and intercurrent infection due to beta-hemolytic streptococci, group A, indicates that this form of prophylaxis is practical and successful.

Chronic Renal Disease in Children: Correlation of Clinical Findings with Morphologic Characteristics Seen by Light and Electron Microscopy. L. R. Vernier, M. G. Farquhar, J. G. Brunson, and R. A. Good. A. M. A. J. Dis. Child. 96:306-343 (Sept.) 1958 [Chicago].

The authors report a study on 72 kidney biopsy specimens from 58 children with diffuse renal disease. Included were children suffering from anaphylactoid purpura, disseminated lupus erythematosus, acute, subacute, and chronic glomerulonephritis, and the nephrotic syndrome. Needle biopsy of the kidney was found to be a safe, relatively atraumatic procedure in children, worthy of extensive use as an investigative technique. Light microscopy revealed the renal lesion of anaphylactoid purpura to be segmental glomerulitis characterized by occlusion of lobules of the glomeruli by fibrinoid material. The glomerular lesion observed in anaphylactoid purpura is similar to an abnormality often seen in disseminated lupus erythematosus, and it is suggested that anaphylactoid purpura probably should be classified as a systemic fibrinoid vascular disease.

The characteristic pathological abnormalities observed in kidney biopsy specimens from children with disseminated lupus erythematosus varied from segmental vascular fibrinoid lesions to severe glomerulonephritis. Serial biopsies in 3 children treated with intensive prolonged corticosteroid therapy confirmed the clinical and laboratory evidence of improvement in renal disease during the interval of treatment. Renal biopsy may occasionally aid in the confirmation of the diagnosis of disseminated lupus erythematosus when other evidence is inconclusive.

Biopsy findings in the patients with glomerulonephritis, including acute, subacute, and chronic cases, supported the concept that acute streptococcic nephritis is an entity separate from subacute or chronic glomerulonephritis. The pathological findings obtained by kidney biopsies in patients with the nephrotic syndrome are correlated with the clinical and laboratory features of the disease It is concluded that the pathology of nephrosis is related to the duration and the severity of the disease.

Electron microscopic observations of 42 rena biopsy specimens from children with glomerulonephritis, the nephrotic syndrome, and disseminated lupus erythematosus revealed glomerula changes. The 3 distinct components of the glomerular capillary wall—endothelium, lamina densa and epithelium—appear to be differently involve early in the course of each of these diseases. Th principal glomerular abnormality observed in the nephrotic syndrome and the only abnormality seen in early or "pure" nephrosis are a marked loss or smudging of epithelial-cell foot processes. Abnormalities of the foot processes have not been seen as an early manifestation in patients with anaphylactoid purpura, glomerulonephritis, or disseminated lupus erythematosus.

Electron microscopy of glomeruli from patients with glomerulonephritis revealed pronounced proliferation of endothelial cells, some proliferation of epithelial cells, and an accumulation of basement-membrane-like material. Early in the course of glomerulonephritis, the epithelial-cell foot processes appeared normal. In the subacute and chronic forms of glomerulonephritis, severer degrees of basement membrane proliferation were observed. Electron microscopy of kidney biopsy specimens obtained early in the clinical course of acute disseminated lupus erythematosus revealed basement membrane thickening and variable degrees of endothelial proliferation. The severity of the basement membrane involvement in disseminated lupus erythematosus seems to be related to the duration of the disease process. Abnormalities of the epithelial cells were encountered only late in the course of the disease.

Repeated Follow-up on Fate of 298 Asthmatic Children. E. Ryssing. Ugesk. læger 120:1052-1056 (Aug. 7) 1958 (In Danish) [Copenhagen].

In 1944, 298 children with asthma were followed up. In 1957, follow-up of 281 of the 293 survivors showed only 106 to be free from symptoms; 16 of these had received desensitization treatment. Thus, 90 patients, or about 30%, had outgrown the disease or had become free from symptoms after different forms of unspecific treatment. Of the 165 patients with symptoms, 135 could do full-time work, 13 found work difficult, 16 were unable to work, and 1 was mentally incapacitated. Ten patients had died, 9 of asthma and 1 of chronic bronchitis. The best chance for continued freedom from symptoms of asthma is in children in whom the disease sets in early, is of short duration, and disappears about the age of 15 years.

Lymphosarcoma in Childhood. S. A. Rosenberg, H. D. Diamond, H. W. Dargeon and L. F. Craver. New England J. Med. 259:505-512 (Sept. 11) 1958 [Boston].

At the Memorial Center for Cancer and Allied Diseases in New York the group of cancers known as lymphosarcoma were analyzed, particular attention being given to their occurrence in children. This study covers the 30-year period from 1928 to 1957, but in order to provide a follow-up period of at least 5 years, only patients in whom the disease began before 1953 are considered. Of 1,269 patients, 69 (or 5.4%) were less than 15 years of age. The authors use the term "lymphosarcoma" to include all primary malignant tumors of lymphoid origin except Hodgkin's disease. An attempt was made to exclude patients with leukemia. The increased frequency of lymphosarcoma in males was seen in the entire group, but the male preponderance was greatest in late childhood, reaching a maximum of 4.5:1.0 in the age group from 11 through 15 years. The ratio of males to females approaches unity in the very young and in the very old. Cervical lymph node enlargement is the most common presenting manifestation in children as well as in adults, but the disease in childhood presents with abdominal symptoms about twice as often as in adults. In the 15 children in whom abdominal symptoms were the initial indications of disease, exploratory laparotomy revealed primary lesions of the small intestine in 5 cases and a lesion of the ileocecal region in 1. Two of these 6 children had mesenteric lymph node involvement as well, and in 3 patients intussusception resulted from the intestinal tumor.

Roentgenographic manifestations of lymphosarcoma in children were found to parallel those seen in adults. Obstruction of the superior vena cava, with characteristic dyspnea, cyanosis, venous engorgement, and edema of the upper half of the body, which is often described as a late manifestation, was seen in 5 children (or 7.2%). Ten of the 69 children (or 14.5%) showed a transition suggesting a leukemic change. Of the 42 children with small-cell lymphosarcoma, the cases of 9 (or 21.4%) ended in leukemia, 5 of these being indistinguishable from acute leukemia. The remaining 4 were classified as leukolymphosarcoma, with incomplete bone marrow invasion or characteristic lymphosarcoma cells in the peripheral blood. One child with reticulum-cell sarcoma showed a picture of acute leukemia during the course of the disease. It was found that, when bone marrow invasion occurred in children, acute leukemia usually supervened, and the therapeutic regimen should be designed in accordance with that diagnosis.

Though the treatment of lymphosarcoma, especially in childhood, is unsatisfactory, the authors feel that judicious use of x-ray therapy continues to be the backbone of the therapeutic program and can provide relief of distressing symptoms and be lifesaving, if only for an unpredictable period. The use of the polyfunctional alkylating agents, alone and combined with adrenal steroids, provides little, if any lasting, benefit to the majority of children. The antimetabolic drugs, chiefly the folic acid antagonists, appear to be useful, particularly in children with a picture of acute leukemia. In specific problems, such as superior vena caval obstruction and spinal cord compression, the polyfunctional alkylating agents administered before radiation therapy appear to have both anticongestant and antitumor effects. The fact that 17.4% of 5-year survivals were among the children, compared with 27.7% among the adults, demonstrates the seriousness of lymphosarcoma in childhood, but it should nevertheless discourage a defeatist attitude.

UROLOGY

Serum Mucoproteins in Prostatic Carcinoma. J. A. Arcadi. J. Urol. 80:192-193 (Sept.) 1958 [Baltimore].

There frequently is an increase in the amount of protein-bound carbohydrates of blood serum in patients with carcinoma. Evidence was presented that the carbohydrate-containing protein of the serum arose from the "ground substance" of the connective tissue, which is the nonfibrillar component or intercellular cementing substance through which collagen and reticulin grow and upon which cells rest (i. e., the basement membrane). In the region of tissue injury, and around growing tumors, the protein-bound carbohydrate (glycoprotein or mucoprotein) was found to be extremely water soluble, as opposed to its relative water insolubility in normal tissue. The author presented evidence showing that the connective tissue glycoprotein of untreated prostatic cancer is quite different in appearance from that of estrogen-treated or castration-treated prostatic cancer.

Two groups of patients were studied. The control group consisted of 25 persons without clinical, roentgenologic, or biochemical evidence of prostatic cancer. The study group consisted of 33 patients with histologically proved carcinoma of the prostate. Those who were treated received Stilbestrol in a dose of 3 mg. per day and/or had a bilateral orchiectomy. Blood was drawn with the patient fasting. Mucoproteins were determined by a slightly modified Winzler method. In the control group, the values of serum mucoproteins ranged from 9 to 17.2 mg. per 100 cc.; this averages 13.2 mg. per 100 cc. In patients with untreated prostatic cancer, the values of serum mucoproteins ranged from 23.3 to 86 mg. per 100 cc.; the over-all average was 49 mg. per 100 cc. All the patients with carcinoma had elevated serum mucoprotein levels. Fourteen patients were followed as to the response of their serum mucoproteins to bilateral orchiectomy and/or Stilbestrol administration. In 12 of the 14 patients a decline in serum mucoproteins was noted 1 to 7 days after the institution of therapy. In 3 patients a rise in serum mucoproteins, after an initial decline, heralded a relapse that was not clinically evident for several more weeks. This observation suggests that the level of serum mucoproteins in prostatic cancer may be of prognostic significance. Most of the patients with prostatic cancer had metastases. It is suggested that serum mucoprotein determinations be made also in patients in whom the tumor is still confined to the prostate. The observations presented further prove the importance of the ground substance in prostatic cancer.

Impotence and the Leriche Syndrome: An Early Diagnostic Sign; Consideration of the Mechanism; Relief by Endarterectomy. V. J. O'Conor Jr. J. Urol. 80:195-198 (Sept.) 1958 [Baltimore].

A young man, whose presenting complaint was inability to maintain penile erections, was found to have early arteriosclerotic occlusion of the aortic bifurcation (Leriche syndrome). Complete return of erectile function followed aortoiliac thromboendarterectomy. Partial impotence may be the earliest manifestation of impaired pelvic blood flow and may be present with minimal occlusive disease of the aorta or iliac vessels. Impotence has been described in patients with localized iliofemoral arteritis, the mechanism being ascribed to reflex vasospasm of the pelvic arteries. In this condition, striking relief has been effected by lumbarsympathectomy. In general, partial or incomplete impotence is produced by organic disease, either neurological or, as in this case, vascular in origin. This differs distinctly from the total impotence associated with psychic disorders.

OPHTHALMOLOGY

Horner's Syndrome: An Analysis of 216 Cases. C. L. Giles and J. W. Henderson. Am. J. Ophth. 46:289-296 (Sept.) 1958 [Chicago].

The classical description of Horner's syndrome lists the components as miosis, ptosis of the upper lid, anhidrosis, and enophthalmos—all on the affected side. Clinicians have designated as Horner's syndrome many cases in which only ptosis and miosis have been present. The studies presented aim to determine the anatomic site of sympathetic interruption and the etiological factors involved in 216 patients with Horner's syndrome observed over a period of 21 years (1936 to 1957) at the University Hospital in Ann Arbor, Mich. The diagnosis had been verified by either the neurological or the ophthalmological service. The constant diagnostic features included ptosis and miosis plus a variable number of other signs.

The following conclusions were drawn from this study: 1. The most common site of interruption of the sympathetic pathway to the eye is in the sympathetic trunk and in the postganglionic fibers before they course intracranially. The upper thoracic and lower cervical anterior spinal roots are affected less than half as often as the sympathetic trunk, while the brain stem, spinal cord, and intracerebral postganglionics are only rarely affected. 2. Neoplasia, malignant far more often than benign, is the most common etiological agent. Bronchogenic and metastatic carcinomas are the most frequent malignancies, and neurofibroma and thyroid adenoma are the only significant benign tumors. Surgical procedures, nonoperative trauma, and vascular disease are less important causes of Horner's syndrome. 3. Neoplasia is the most important factor incriminated in sympathetic trunk lesions, while trauma and vascular disease are the most frequently encountered agents at the anterior spinal root and brain stem levels respectively. Interruption of the spinal cord sympathetic pathway was most commonly a result of trauma. Herpes zoster was the only lesion implicated in an intracranial postganglionic lesion. 4. Horner's syndrome is seen most commonly in the older age groups. In the first 2 decades of life trauma is the most common etiology. Malignant and benign neoplasms account for the largest percentage of sympathetic interruption in the 3rd, 4th, and 5th decades. In the group over 50 years of age malignant tumors are more likely. 5. In view of the frequently serious nature of the lesions involved in the production of a Horner's syndrome, a complete investigation is warranted.

THERAPEUTICS

Mephentermine and the Arrhythmias. M. Wilson, M. Perez-Arzola and M. J. Oppenheimer. Am. J. M. Sc. 236:300-310 (Sept.) 1958 [Philadelphia].

The clinical studies described aimed to evaluate the acute response of various cardiac arrhythmias in the abnormal heart to mephentermine sulfate, a member of the pressor amine group of drugs. Twelve patients were studied: 8 males, from 52 to 80 years, and 4 females, from 24 to 36 years of age. One patient was studied on 2 different occasions. Seven patients had arteriosclerotic heart disease; 3, hypertensive heart disease; 1, active rheumatic fever; and 1, a congenital complete heart block. Six were in chronic congestive heart failure, and one had had a recent myocardial infarction. Nine patients were receiving digitalis; one was considered to have digitalis toxicity. After a 12-lead electrocardiogram and after a long tracing of the lead that showed best either the P wave or the arrhythmia, mephentermine sulfate was given intravenously. Subsequent long tracings were taken after each administration of the drug and from 10 minutes to 4½ hours after completion of total dosage. In some cases electrocardiograms were taken the next day.

It was found that mephentermine sulfate has an antiarrhythmic effect upon the diseased human heart. This salutary action was especially noted in patients with ventricular ectopic systoles. The mechanism of action is a decrease in the refractory period, an increase in the velocity of conduction, and a positive inotropic effect. With doses up to 3 mg. per kilogram administered intravenously, there was no significant electrocardiographic effect in patients with chronic atrial fibrillation. Effective reduction in functional atrioventricular block was produced. Supraventricular tachycardia with second-degree atrioventricular block represents a contraindication to the use of mephentermine. The antifibrillatory properties of mephentermine may be of value in open heart surgery with therapeutic cardiac arrest. Theoretically, an oral preparation of mephentermine may find use as an adjuvant to digitalis in patients with chronic congestive heart failure.

Results of Treatment of Tuberculous Meningitis by Oral Administration of Neoteben. J. Gehrt. Monatsschr. Kinderh. 106:357-361 (Aug.) 1958 (In German) [Berlin].

The author reports on 70 children, between the ages of less than 2 and 14 years, with tuberculous meningitis who were treated at the pediatric clinic of the City Hospitals in Wuppertal, Germany, between 1948 and 1957. Of the 70 children, 34 were treated with streptomycin given by intramuscular and intrathecal routes; 11 of these obtained a cure, while 23 died. Seven children treated in 1951 and 1952 were given for the first few weeks or months streptomycin by intramuscular and intrathecal routes and then Neoteben, a proprietary preparation of isonicotinic acid hydrazide, given orally in doses of 10 mg. per kilogram of body weight; all 7 children obtained a cure, although 3 of them suffered permanent mental impairment. Of the remaining 29 children who were treated between 1952 and 1957, one group of 6 received combined treatment with streptomycin and Neoteben; 2 of the 6 died within the first 5 days after admission; of the surviving 4, 2 obtained a cure, and 2 died. In the other group of 23 children, who received Neoteben exclusively or Nicoteben, a compound of Neoteben and isonicotinic aldehyde thiosemicarbazone, 1 died within the first 5 days after admission; of the remaining 22, 20 obtained a cure, and 2 died. One of the 2 who died, and who had been given phenobarbital (Luminal) in addition to Neoteben, had a sudden onset of extensive hemorrhages of the skin and the mucosa in the complete absence of thrombocytes, thus presenting the picture of thrombopenic purpura. An increased allergic disposition apparently was responsible for the occurrence of the thrombopenic purpura.

The case of 1 of the 20 children who recovered, a 3½-month-old infant with miliary tuberculosis and meningitis (positive cerebrospinal fluid in animal experiments), is reported in detail. The child is at present 4 years old and completely healthy. Early institution of treatment is essential. Neoteben should be given orally immediately, even if the result of lumbar puncture at first leaves it unsettled whether the patient may have abacterial or tuberculous meningitis. Combined treatment with Neoteben orally and streptomycin intrathecally should be given a trial in patients with far-advanced meningitis. A still further improved cure rate may be expected from early additional treatment with cortisone preparations.

Initial Sensitivity to Streptomycin and Isoniazid of Mycobacteria Isolated from Previously Untreated Patients with Primary Pulmonary Tuberculosis. G. Spina, G. Mescolini and M. Zubiani. Ann. Ist. Carlo Forlanini 18:47-61 (No. 1) 1958 (In Italian) [Rome].

The authors investigated the resistance to streptomycin and to isoniazid of mycobacterium tuberculosis, the organisms being recovered from the sputum and the gastric contents of 74 patients with primary pulmonary tuberculosis who had not previously received chemotherapy. The virulence of the recovered tubercle bacilli was high, as was demonstrated by inoculating them into guinea pigs. Strains of bacilli resistant to streptomycin and/or isoniazid were found in 3 patients. The micro-organisms recovered from one patient, who was 20 years of age, proved to be resistant to streptomycin in a concentration of 10 mcg. per cubic centimeter and to isoniazid in a concentration of 0.5 mcg. per cubic centimeter. The other 2 patients were a brother and a sister, aged 5 years and 17 months respectively. The micro-organisms recovered from the boy proved to be resistant to streptomycin in a concentration of 100 mcg. per cubic centimeter and to isoniazid in a concentration of 10 mcg. per cubic centimeter. The micro-organisms from his sister were slightly resistant and only to isoniazid in a concentration of 0.1 mcg. per cubic centimeter. Both brother and sister were infected with Myco. tuberculosis at the same time and apparently from the same source—an uncle. It is, therefore, possible that the uncle spread simultaneously different strains of bacilli, each one being resistant to streptomycin and to isoniazid in varying degree. It is also likely that the authors were unable to isolate from the cultures derived from the girl those strains which were highly resistant to the 2 antibiotics. A combined treatment with streptomycin and isoniazid for 4 or 5 months brought about remission of the tuberculous disease in all 3 patients.

Four Year Evaluation of an Antihypertensive Agent. E. Roberts. J. Am. M. Women's A. 13:349-352 (Sept.) 1958 [New York].

The author investigated the long-term effects of a combination drug, which contains rauwolfia, protoveratrine, and phenoxybenzamine in fixed amounts, since there was evidence that preparations containing small amounts of several antihypertensive agents, each of which acts on a different site of the vascular complex and thereby produces a combined therapeutic effect, may be superior to larger doses of a single drug. Sixty-five patients (51 women and 14 men) were selected for evaluation on the basis of significantly elevated blood pressures and other symptoms associated with hypertension. Thirty patients were 60 years of age or older. Forty-seven patients had, in addition to elevated blood pressures, one or more of the following hypertensive symptoms: headaches, chest pains, dyspnea, insomnia, persistent fatigue, and pulse or heart consciousness. Mild neurotic symptoms, such as periodic moods of nervousness or depression, were present in 34 patients. Menopausal symptoms, manifested by menstrual disturbances, crying spells, and idiopathic gastrointestinal disturbances, were present in 17 patients.

Seven patients withdrew from the evaluation during the first month. The remaining 58 patients were treated with the compound for periods up to 4 years. Blood pressures were reduced to normotensive levels in 59% and to satisfactory levels in 24%. Of 8 patients in whom normotensive pressures had been maintained for a year with the drug, and in whom medication was then discontinued, 7 remained normotensive; the other patient had a blood pressure elevation to pretherapy levels within 4 months, but the blood pressure was again reduced to a normotensive level by resuming therapy.

Fifteen patients complained of nasal congestion as a side-effect; 7 of these dropped out of the evaluation during the first month; in the other patients the condition cleared up within 8 weeks. There were no other side-effects. Thirty patients (52%) had an excellent over-all response to the medicament, and another 18 (31%) had a good response; ten patients (17%) achieved relief of accompanying hypertensive symptoms but did not achieve lowered blood pressures. The rauwolfia-protoveratrine-phenoxybenzamine preparation, can be used when long-term antihypertensive therapy is required.

Antibiotics in Bartonellemia in Man. P. Larrea R. Arch. peruanos pat. y clín. 12:1-41 (March) 1958 (In Spanish) [Lima, Peru].

One hundred fifteen patients with bartonellosis in the septicemic phase were observed at the Hospital of the Faculty of Medicine of the University of Lima between 1947 and 1957. The treatment consisted of the administration of antibiotics; penicillin, streptomycin, tetracycline, chloramphenicol, chlortetracycline, erythromycin, and nitrofurantoin (Furadantin) were used. The patients were placed in either of 2 groups: (1) those who were hospitalized in the course of the toxic-infectious phase (with fever, bacillary forms of Bartonella organisms in the peripheral blood, and rapidly developing anemia) and (2) those who were hospitalized in the course of the immunity reaction of the body (with or without fever, coccobacillary forms of Bartonella organisms in the peripheral blood, and anemia in a stage of regeneration). In the 54 patients in the first group, all antibiotics gave satisfactory results: Fever abated within 24 hours and disappeared within 48 to 72 hours; destruction of red blood cells stopped within 48 hours, after which regeneration of the erythrocytes continued; and bacillary forms of Bartonella organisms changed into the coccobacillary forms within 24 hours and disappeared from the blood within 5 days. In the 59 patients in the second group, the results of antibiotic treatment could not be evaluated, since antibiotics act upon the bacillary but not upon the coccobacillary forms of Bartonella organisms. Destruction of the coccobacillary forms is accomplished by the reticuloendothelial system. Fifty-nine patients out of the 115 observed had complications. Salmonella organisms of various types were identified in 25 cases and other organisms in 10 cases. Twenty-nine patients with complications died.

The author concludes that antibiotics are efficacious in controlling bacillary bartonellemia if they are administered during the toxic-infectious phase of the disease. Antibiotics do not prevent the secondary complications of bartonellosis. The percentage of complications, the presence of Salmonella organisms, and the death rate are less in patients treated with chloramphenicol than in those treated with other antibiotics. Chloramphenicol has a double effect on the bacillary forms of Bartonella organisms in the blood and on Salmonella organisms.

New Therapeutic Drug (Iproniazid) in Angina Pectoris. A. Casellas Bernat. Med. clín. 30:322-328 (May) 1958 (In Spanish) [Barcelona, Spain].

Satisfactory results from the administration of Iproniazid (a derivative of isoniazid) in patients with coronary insufficiency and frequently severe crises of angina pectoris were reported in *Archivos del Instituto de cardiología de Mexico* (27:563-580

[Sept.-Oct.] 1957; abstracted, J. A. M. A. 166:1531 [March 22], 1958). Eight patients with coronary insufficiency and angina pectoris and one with intermittent claudication secondary to arteriosclerosis obliterans were treated with Iproniazid at the Hospital of the School of Cardioangiology of the University of Barcelona between November, 1957, and February, 1958. The patients were between the ages of 29 and more than 50 years. In patients with coronary insufficiency, the anginal symptoms were severe on mild exertion and in some patients even at rest. The disease had lasted between 5 months and 5 years, with previous failure of all treatment in common use for angina pectoris. The electrocardiograms of these patients showed pathological changes of the types of myocardial infarction, left branch blockage, or anterolateral ischemia. The patients had one or more of the following conditions: hypertension, marked cardiosclerosis, or syphilis. In the patient with intermittent claudication, the disease had lasted 2 years; pain restricted walking at a distance of 50 meters.

Iproniazid was given in daily doses of 150 mg. to the patients with angina pectoris and of 200 mg. to the patient with intermittent claudication. The drug was given for 10 consecutive days, after which the dose was diminished according to tolerance and individual needs. Anginal pain disappeared between the 4th and the 13th day of administration in most patients; diminution of the dose did not cause its reappearance. In one patient, however, discontinuation of treatment resulted in the reappearance of pain, which disappeared only after re-establishment of treatment for a few days. Unpleasant side-effects from the drug were mild, consisting of gastrointestinal and nervous disorders, dizziness, and difficult micturition. In no case did these secondary effects make it necessary to discontinue administration of the drug. Partial recovery of functional capacity has been obtained in all the patients. The patient with intermittent claudication has been able to walk a distance of about 1,250 meters (or three-fourths of a mile) without pain or discomfort. The author believes that Iproniazid is of value in angina pectoris and in intermittent claudication. The treatment calls for certain precautions; it should be given only by cardiologists to hospitalized patients.

The Diagnostic Meaning of the Changes of Calcium Metabolism After Administration of Sex Steroids in Mammary and Prostatic Cancer. G. M. Molinatti, F. Camanni and M. Olivetti. Minerva med. 49: 2389-2400 (June 16) 1958 (In Italian) [Turin, Italy].

The authors investigated the usefulness of a sex steroid stimulation test for hormone dependency, devised by Pearson, in 39 patients who had either mammary or prostatic cancer with osseous metastases. The test consisted in measuring calciuria, calcemia, and serum phosphorus and alkaline phosphatase levels before, during, and after the administration of sex steroids to the patients. The patients were kept on a low calcium diet throughout the investigation. Two courses of sex steroids, with a short drug-free period in between, were given to all patients. In the first course ethinyl estradiol was administered by mouth in daily doses of 0.15 mg. to 28 patients with advanced cancer of the breast, whereas testosterone propionate was given intramuscularly in daily doses of 100 mg. to 11 patients with advanced prostatic cancer. The second course consisted in the administration of testosterone to the patients with mammary cancer and in the administration of estrogens to the patients with prostatic cancer.

Before the administration of sex steroids, the urinary excretion of calcium was elevated in most patients with mammary cancer involving bones. Administration of estrogens produced a significant change in calcium and phosphorus metabolism in most patients with mammary cancer. Changes in the daily urinary excretion of calcium were the most significant metabolic response to estrogens. After administration of estrogens, calciuria increased only slightly in 2 patients who had a high calciuria level before the treatment, and it increased considerably in 7 patients who had a low calciuria level before the treatment. Calciuria changed insignificantly in 5 patients, and it decreased in 3 patients. Increased calciuria was accompanied by deterioration in clinical symptoms, and the converse developed in patients with decreased calciuria. The latter group consisted of postmenopausal women. Administration of androgens did not affect the calciuria level in patients in whom the estrogen therapy caused an increased calciuria level. Decreased calciuria was accompanied by relief of pain and by improvement in the state of health. The test devised by Pearson was a fairly accurate procedure for establishing the estrogen dependency of cancer of the breast in this series of patients and thus arriving at the most suitable endocrine treatment. The test, however, produced inconsistent responses in the daily levels of urinary excretion of calcium in patients with mammary cancer during the different phases of ovarian activity.

Before the administration of sex steroids to patients who had prostatic cancer with bone metastases, a decreased calciuria, an increased calcemia, a decreased serum phosphorus level, and an increased serum alkaline phosphatase level were observed. Administration of testosterone did not affect significantly the calcium and phosphorus metabolism. Pain, however, was intensified considerably, which required discontinuance of the treatment. Consequently, Pearson's test was not useful for investigating the androgen dependency of prostatic cancer, but it might be used for investigating the deterioration of pain related to it. Observation of changes in calcium and phosphorus metabolism after administration of sex steroids in patients with mammary or prostatic cancer is a useful diagnostic procedure for detecting bone metastases earlier than by roentgenography.

Systemic Lupus Erythematosus: Results of Treatment with Triamcinolone. E. L. Dubois. California Med. 89:195-203 (Sept.) 1958 [San Francisco].

Twenty-two women and 7 men, of an average age of 33.7 years, with active systemic lupus erythematosus were treated with triamcinolone (Aristocort), a new synthetic unsaturated derivative of prednisolone, for periods varying from 4 days to 10½ months and averaging 4.3 months. The average duration of illness from the time of onset was 92 months. Four patients were well stabilized by the administration of other steroids when they were transferred to triamcinolone, and 14 had exacerbations of varying severity. The remaining 11 patients had not recently received treatment with other steroids. Treatment with triamcinolone was instituted in these 11 patients with a daily dose varying from 4 to 40 mg. The average dose for beginning therapy in patients with mild systemic lupus erythematosus was 20.6 mg. per day. The average maintenance dose used to control mild exacerbations of the disease was 26 mg. per day. Triamcinolone proved to be 1.3 times as powerful as prednisone and 4.4 times more potent than hydrocortisone as an anti-inflammatory agent. There was no evidence of sodium retention or potassium loss.

Sixteen patients underwent upper gastrointestinal roentgenologic studies before and during treatment with triamcinolone. There was no evidence of peptic ulcers except in one patient who was receiving a daily dose of 96 mg. of the drug. Free and total gastric acidities were determined before and after subcutaneous injection of histamine in 9 patients before and during treatment with triamcinolone. No significant changes were noted in results of these tests, even in the patient who had an ulcer. No abnormal increase in uropepsin was noted in the patients in whom this factor was tested.

The pattern of clinical improvement closely paralleled that obtained by previous treatment with older steroids. Seven of the 14 patients with exacerbations during treatment with the older anti-inflammatory hormones were better controlled and felt better with triamcinolone. There was a disappearance of all the clinical and laboratory abnormalities produced by the disease, with the exception of long-standing renal involvement. A major difference between the effects produced by triamcinolone and other steroids was a tendency of the patients to progressive gradual loss of weight, partly due to loss of fluid. Moon-face appearance produced by previous therapy with other steroids did not disappear. The cutaneous side-effects, particularly moon face, hirsutism, and striae, were more pronounced than with the older steroids. The most serious side-effect was muscle weakness, which appeared in 6 patients, all women, within 4 to 32 weeks after the institution of triamcinolone therapy. The profound muscle weakness, most pronounced in the quadriceps group, gradually cleared after treatment for several weeks with another steroid. Because of the great variability in dosage and individual unpredictability of action of the new agent, one may prefer to begin treatment of the average patient with systemic lupus erythematosus with hydrocortisone, unless there is a problem of cardiorenal disease.

First Observations on Therapy with Triamcinolone: Clinical, Laboratory and Experimental Findings. R. Scalabrino. Minerva med. 49:2825-2837 (July 21) 1958 (In Italian) [Turin, Italy].

The author reports on the clinical and laboratory findings of triamcinolone therapy in 32 patients and on experimental study with the drug in rats. Rheumatic fever was present in 4 patients, rheumatoid arthritis in 4, granulocytopenia in 2, acute leukemia in 2, grave sepsis in 4, bronchial asthma in 2, scleroderma in 1, psoriasis in 1, dermatitis herpetiformis in 1, premenstrual syndrome accompanied by presence of androgen substance in the blood in 2, hay fever in 3, exudative pleuritis in 2, metastatic mammary cancer with bilateral adrenalectomy in 1, food allergy with diffuse urticaria in 1, and diabetes associated with rheumatic disease in 2.

Triamcinolone was administered to the patients in daily doses of from 6 to 60 mg. Fever began to abate 48 hours after the beginning of treatment, and the temperature returned to normal after 4 or 5 days of the therapy. An average daily dose of 16 mg. was sufficient to control fever, but high doses reaching 60 mg. a day were required for fever control in patients with rheumatoid arthritis; triamcinolone was replaced by prednisone in some febrile patients with this disease or with scleroderma. Joint pains disappeared rapidly in acute and subacute types of rheumatoid arthritis with daily dosages of from 12 to 18 mg. of triamcinolone. Diuresis increased up to 100% in this series of patients. Certain side-effects peculiar to triamcinolone therapy were observed in all the patients: headache, gastric discomfort, weakness, nausea, lack of appetite, depression, sweating, somnolence, and, in a few instances, insomnia. Triamcinolone produced side-effects common to other steroid therapy in 3 patients only; each of these exhibited moon facies and erythematous disorder of the skin, with deterioration from the symptoms in an older patient with diabetes. Arterial blood pressure varied slightly, being similar to the change with prednisone therapy. Administration of triamcinolone caused abatement of the characteristic pericardial frictional murmur in patients with rheumatic fever; likewise, the heart sounds improved. Roentgenography confirmed the clinical improvement, and the cardiac diameter decreased in some patients after 5 days of this chemotherapy. Electrocardiographic patterns showed improvement in all but the older patients. Laboratory findings revealed increase in hemoglobin level, red blood cell count, and number of granulocytes after 8 to 12 days of therapy with triamcinolone, and the erythrocyte sedimentation rate started to decrease after 3 to 5 days.

Experimental studies for comparing the effects of prednisone and of triamcinolone were made on 60 rats divided into 6 equal groups. Prednisone was given to 3 groups, triamcinolone to 2, and 1 group was used for control. Prolonged administration of triamcinolone determined involution of the adrenal cortex and the thymus even more than prednisone did. It is too early to evaluate the therapeutic effects of triamcinolone as compared with other steroids. The dosage of triamcinolone is smaller by 30% than that used in the administration of other steroids. This is advantageous for maintenance treatment of patients with asthma or allergic disorders or total adrenalectomy for mammary cancer. Triamcinolone does not produce certain undesirable effects related to steroid administration, but it brings about different effects which have not been observed in therapy with other steroids.

RADIOLOGY

Pulmonary Torulosis. L. G. Jacobs. Radiology 71: 398-403 (Sept.) 1958 [Syracuse, N. Y.].

The author reports on 10 men, between the ages of 22 and 62 years, with pulmonary torulosis who were admitted to the Veterans Administration Hospital in Oakland, Calif., during the last 10 years. Chest roentgenograms revealed consolidation of the left upper lobe in 1 patient, a granulomatous mass lesion in the right upper lobe in 1 patient, a small solitary nodule in either the left lower or the left upper lobe in 5 patients, and a small solitary nodule in the right lower lobe in 3 patients. A lobectomy was performed on the first 2 patients and a wedge resection on the other 8 patients. Microscopic examination of the surgical specimen in 8 of the patients revealed the late stage of the granuloma of torulosis, with a "caseous" necrotic center surrounded by moderately well-developed connective tissue in which groups of lymphocytes and occasional giant cells and plasma cells were seen. Spherule-like organisms were well demonstrated by employing the periodic acid-Schiff stain. All the patients were well 7 to 48 months after the resection.

A modified concept of torulosis of the lung is presented as follows. The disease is considered as a generally benign infection, healing by formation of a fibrocaseous nodule in which organisms, morphologically typical of those of Torula, are found on microscopic examination but cannot be cultured, being presumably inactive or dead. This type of lesion appears to represent most of the cases. The mortality rate is relatively high, possibly 60%, in certain patients with active disease causing progressive pulmonary or extrapulmonary lesions. In those patients with disease limited to the lung, cure by resection may be obtained, but most patients with meningeal or generalized lesions die despite any form of therapy known at the present time.

Reversible Bronchiectasis. S. W. Nelson and A. Christoforidis. Radiology 71:375-382 (Sept.) 1958 [Syracuse, N. Y.].

The authors report on 4 patients, a 17-year-old boy, a 28-year-old woman, a 10-year-old boy, and an 11-year-old girl, with bronchiectasis in whom all the bronchopulmonary segments were examined bronchographically. In order to determine whether or not there had been progression of the disease, bronchographic studies were repeated during a 15-month period. The first patient had been treated with streptomycin for an acute episode of lobar pneumonia in the lower lobe of the left lung 5 weeks before the diagnosis of bronchiectasis was made. There was no previous history of respiratory trouble, and the bronchiectasis disappeared in the 25-day interval between the first bronchogram and the second admission to hospital for contemplated surgical intervention. The second patient had a long history of cough, and the original bronchogram was justified because it was surmised that the patient might have bronchiectasis or a bronchial adenoma, either of which might have precipitated an episode of acute pneumonia and atelectasis. When bronchiectasis was found, it was, therefore, assumed to be related to the long history of productive cough; surgical intervention was felt to be advisable, but it was postponed since the patient was pregnant. A second bronchogram, which was obtained 6 months later, revealed complete disappearance of the previous changes, making operation unnecessary. In the third patient, bronchiectasis occurred in the course of acute pneumonia. The dilated bronchi in this patient returned to normal roentgenographically, and, although the patient's cough persisted, it is not probable that surgical removal of the temporarily dilated bronchi would have removed the source of so common a childhood respiratory symptom. The original bronchogram was obtained from the fourth patient because of chronic productive cough, and it was no surprise to see the bronchiectatic changes. The second bronchogram, obtained a year later, showed normal bronchial filling without evidence of bronchiectasis.

Subsequent bronchograms obtained from these patients have proved that bronchiectasis is still reversible when its presence is revealed by the original bronchograms. It is important for the radiologist to recognize and emphasize to his clinical colleagues that bronchiectasis in its early stages is frequently a reversible process, particularly in children and young adults after acute pneumonia and atelectasis. Therefore, before surgical excision is contemplated, thorough medical management, including administration of antibiotics, postural drainage, and breathing exercises, should be tried. Careful bronchography is the most reliable and practical diagnostic method for detecting bronchiectasis, and repeated bronchographic studies should be done in order to follow accurately the course of the disease.

PHYSIOLOGY

Movements of the Common Bileduct in Man: Studies with the Image Intensifier. W. Burnett and R. Shields. Lancet 2:387-390 (Aug. 23) 1958 [London].

The authors studied possible peristaltic movements in the common bile duct of 10 patients 1 or 2 weeks after cholecystectomy or choledochotomy. These studies were carried out in the unanesthetized patients by using image intensification. A water-miscible contrast medium, a 50 or 70% solution of sodium acetrizoate, was instilled at the rate of 1 cc. a minute into the common bile duct. In cases of cholecystectomy the injection was made through a ureteral catheter, which had been inserted at operation for a distance of about 1 cm. into the common bile duct through the stump of the cystic duct. If the common bile duct had been explored by choledochotomy, the injection was made through a short T-tube left in the common bile duct at operation. An initial injection of 3 cc. of the solution was made. Screening was done at this time to observe the filling of the duct. Since the duct emptied into the duodenum, further increments of the same or less volume were instilled, the amount being determined by the rate of emptying. No disturbance occurred in the patient, and no distention of the common bile duct was allowed to take place at any time. Observations were made both during the injection and afterwards. After the passage of 5 to 10 minutes for stabilization of conditions, permanent records were made by cineroentgenography simultaneously with screening.

Waves of peristalsis were observed in the common bile duct in all 10 patients studied, whether this duct was intact or had previously been explored. The waves of peristalsis were directed distally along the common bile duct toward the duodenum and propelled bile into the duodenum. Respiratory and duodenal movements were also studied; they played no great part in emptying the common bile duct under the conditions of the authors' observations. It is believed that there is sufficient muscle in the wall of the bile duct to produce these observed rhythmic movements. Due to this intrinsic muscle, the common bile duct functions as an actively contracting duct rather than as a passive transmitter of bile. This concept may modify current views on the genesis of biliary pain and permit consideration of common bile duct colic as an entity similar in nature to ureteral and intestinal colic.

BIOCHEMISTRY

Serum Phospholipids: Genetic and Environmental Influences. L. E. Schaefer, D. Adlersberg and A. G. Steinberg. Circulation 18:341-347 (Sept.) 1958 [New York].

The authors determined the phospholipid levels in the serums of 1,067 normal persons, 516 male and 551 female, between the ages of 2 and 77 years, who were part of a total sample of 1,236 persons, representing a healthy and unselected group of New York City employees and members of their families, living on Staten Island. Of the 1,067 persons, 580 belonged to 156 families, consisting of 156 fathers, 156 mothers, and 268 children of these parents. Results showed that serum phospholipid levels increased with age but in a different way for the 2 sexes. In the males, the levels remained practically constant until the age of 20 years, then they rose sharply to the age of 32, after which they remained constant until the age of 60. In the females, the levels remained constant until the age of 32 years, and then they rose gradually until the age of 60. These age-sex changes in serum phospholipid levels were similar to those observed for serum cholesterol levels, but they were of lesser magnitude.

Correlation coefficients in the members of the 156 families indicated the existence of a genetic factor determining serum phospholipid levels in healthy persons; negative mother-father and positive parent-child and sibling-sibling correlations were revealed. These observations suggest that common environment in a family does not result in common serum phospholipid levels unless blood relationship exists, and that diet cannot be the only factor in determining serum phospholipid levels of healthy persons. Because of the age-sex variations of serum phospholipid levels and serum cholesterol levels, no single arbitrary line can be drawn between normal and abnormally elevated levels of these 2 serum lipid fractions. The levels are distributed as continuous variables. The upper 5% levels of each age and sex group may be utilized to characterize hyperphospholipidemia and hypercholesterolemia respectively.

BOOK REVIEWS

Essentials of Pediatrics. By Philip C. Jeans, A.B., M.D., F. Howell Wright, B.S., M.D., Professor of Pediatrics, University of Chicago, Chicago, and Florence G. Blake, R.N., M.A., Associate Professor of Nursing Education (Nursing Care of Children), University of Chicago. Sixth edition. Cloth. $6. Pp. 714, with 115 illustrations. J. B. Lippincott Company, East Washington Sq., Philadelphia 5; 4865 Western Ave., Montreal 6, Canada; Pitman Medical Publishing Company, Ltd., 45 New Oxford St., London, W. C. 1, England, 1958.

Recent advances in pediatrics necessitate frequent revision of texts designed for teaching. This volume should be especially helpful for the student and graduate nurse as a textbook since it conveys information concerning basic principles and places proper emphasis on changing trends. Both normal and abnormal factors in physical and emotional growth and development are considered. The role of the nurse is a complex involving human relationships and adjustments in addition to competence and skill in the practice of her profession. A special feature of this new edition is the inclusion of a section at the end of each chapter entitled, "Situations for Further Study," and a bibliography. This enables the serious student to apply in practical fashion some of the knowledge obtained in the preceding chapter. The order of presentation of the material illustrates many facets of the problems of pediatric nursing. An essential foundation for the management of disease involves proper nursing care and a knowledge of the normal. Reorganization has improved the effectiveness of the book as a text.

Thorough coverage of the subject has been accomplished within the limitations of a single volume. Unit 1 covers expected growth and development including requirements for optional nutrition; unit 2 considers the kinds, incidence, and severity of diseases among children, and preventive measures; unit 3 treats the rudiments of nursing care, both physical and psychological; unit 4 discusses in detail diseases and special problems relating to the nursing care of the infant; and unit 5 discusses diseases characteristic of the older child, and includes such diversified subjects as allergy, burns, obesity, and the collagen diseases. The revised edition includes important advances in knowledge. Illustrations are informative, and an index is provided. This text should serve as a practical aid for more complete understanding of the child in health and disease.

Radiation Protection. By Carl B. Braestrup, Director, Physics Laboratory, Francis Delafield Hospital, New York, and Harold O. Wyckoff, Chief, Radiation Physics Laboratory, National Bureau of Standards, Washington, D. C. Cloth. $10.50. Pp. 361, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This clear and readable textbook provides a compilation of information covering the practical aspects of protection from x-rays, gamma rays, and particulate ionizing radiation. In addition to giving the background underlying the practice of radiation protection, it provides the tables, graphs, and formulas essential for determining proper protective barriers, particularly when used in conjunction with the various handbooks of the National Committee on Radiation Protection. Both Braestrup and Wyckoff are experienced workers in the field, and many useful practical points are included. In view of the current interest in the measurement of beta rays, rather more emphasis might have been laid on beta ray instrumentation. The chapter on biological effects of radiation by Evans and Lough is factual but overly condensed. Specific bibliographic references for the several sections of the chapter would have been much more helpful than a general bibliography for the chapter as a whole. Thus, the reader interested in learning more about specific ionization or linear energy transfer has been provided no guidance as to where to turn for added information. In reading a small volume one can always be critical of the bibliographic references chosen, but this is perhaps not fair. While it may be unfair to criticize the particular choice of bibliographic references, there are a few particularly valuable references that have been omitted such as Trout and Gager, Speare, or Richards. The method for determining radium leakage on page 301 is outmoded. The electroplating technique is probably 1,000 times more sensitive and is the method generally preferred by insurance companies.

Fit to Teach: Yearbook on Teacher Health. [Fred V. Hein, editor.] Cloth. $3.50. Pp. 249, with illustrations. American Association for Health, Physical Education, and Recreation, a department of National Education Association, 1201 Sixteenth St., N. W., Washington 6, D. C., 1957.

Twenty years have elasped since the first edition of this book appeared. This new edition has been completely rewritten jointly by a group of experts in health education and although the emphasis throughout is on physical and mental health in teachers, most of what is said is applicable to fitness

---

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

in general. The book was written as a practical guide for teachers, school administrators, and all others concerned with the health of teachers. Although the mental, emotional, social, and physical aspects of the subject are sometimes discussed separately, their interrelationship is constantly stressed. Each chapter has a bibliography and those chapters that readily lend themselves to summary have one. The major subjects discussed include (1) the task of the teacher, (2) resources for health protection and promotion, (3) health problems, (4) the teacher's health and the pupil, (5) school organization and teacher health, (6) administrative responsibilities for teacher health, (7) personal responsibility for physical and mental health, (8) the community's responsibility for teacher health, (9) health problems of advancing years, (10) health education for teachers, and (11) teacher *health and professional relations. There is no index.*

Diseases of the Liver and Biliary System. By Sheila Sherlock, M.D., F.R.C.P., M.R.C.P., Physician and Lecturer, Department of Medicine, Postgraduate Medical School, University of London, London. Second edition. Cloth. $11.50. Pp. 719, with 213 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This edition of a well-known book brings the material up to date. The general format has remained unaltered, but important additions have been made *in the sections on bile pigment metabolism,* drug-induced jaundice, and hepatic coma. The section on jaundice in infancy has been expanded to include a general discussion of hepatic disease in childhood. Much other new material has been added, including electron microscopy of the liver cell, serum transaminases, circulatory phenomena in liver failure, penicillamine in dermatitis exfoliativa, and epidemiology in primary hepatic cancer. More than 500 new references and 37 new figures have been added. This book continues to be one of the best general treatises on liver disease. The style is clear and concise and the material is presented in such a way as to be useful to the practitioner as well as to the specialist in the field. It is highly recommended.

Etiology and Treatment of Leukemia: Proceedings of the First Louisiana Cancer Conference. Edited by Walter J. Burdette, Ph.D., M.D., F.A.C.S., Professor and Head of Department of Surgery and Director of Laboratory of Clinical Biology, University of Utah College of Medicine, Salt Lake City. Sponsored by Louisiana Division, American Cancer Society, Inc., Louisiana State University School of Medicine, and Tulane University School of Medicine. Cloth. $4 Pp. 167, with illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

These papers deal with the cause, diagnosis, and treatment of leukemia. For the most part the presentation is by well-known authorities. Highlights of the book are the informal discussions following each paper which often clarify obscure points, but even more often point out glaring gaps in our knowledge of fundamental aspects of the disease, its biologic behavior, and unpredictable responsiveness. A beautiful summary paper is presented by the editor. There is an excellent bibliography. The book is well indexed both as to subject matter and as to authors. The typography is beautiful. Unfortunately this book will be of prime interest only to workers in a limited field, but members of most disciplines in medicine could profit by reading it.

Electrocardiogram Clinics. By Joseph E. F. Riseman, M.D Assistant Clinical Professor of Medicine, Harvard Medica School, Boston, and Elliot L. Sagall, M.D., Instructor i Medicine, Harvard Medical School. Cloth. $10.50. Pp. 259 with illustrations. The Macmillan Company, 60 Fifth Ave New York 11, 1958.

This volume presents an original concept in the study of cardiovascular disease. For example, a series of electrocardiograms is reproduced and each case is discussed briefly. The net result is fortunate, as it has been possible to limit the presentations to items of importance in reaching an accurate diagnosis, thus materially increasing the utility of the text. In tables 1 and 2 the normal variations of the ST segments and T waves are set forth for the three standard leads as well as for leads aVR, aVL, aVF, and V_2. In that table the ST displacements are pre*sented for all of the commonly recorded leads. This is the general procedure throughout the book.* The book is an addition of some value to the growing literature of cardiovascular disease and its precise recognition. It can be recommended to those interested in the correct diagnosis of cardiovascular disease or suspected cardiovascular disease.

Human Parturition: Normal and Abnormal Labor. By Norman F. Miller, B.S., M.D., F.A.C.S., Professor of Obstetrics and Gynecology, University of Michigan Medical School, Ann Arbor, T. N. Evans, A.B., M.D., F.A.C.S., Associate Professor of Obstetrics and Gynecology, University of Michigan Medical School, and R. L. Haas, A.B., M.D., F.A.C.S. Cloth. $7.50. Pp. 248, with 67 illustrations: Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1958.

This book is an excellent contribution to one area of obstetrics, namely, labor. It deals with normal and abnormal labor in a concise, clear, and interesting manner. Much time, effort, and research went into the preparation of this volume. Many of its contents are in outline form, easy to understand and to follow, with frequent and excellent illustrations, many of them pen and ink drawings which are unusually attractive. Basic factors and mechanisms involved in human parturition are clearly delineated. This is followed by a description and visual portrayal of abnormal labor and a discussion of complications. This holds the reader's interest throughout. This book should be of great value to the student, general practitioner, and specialist

QUESTIONS AND ANSWERS

TREATMENT OF METASTATIC THYROID CARCINOMA

To the Editor:—*A 33-year-old woman had a thyroidectomy in 1949 for a papillary thyroid carcinoma. A few months ago, she developed an upper respiratory infection followed by a pneumonitis on the right side. X-ray of the chest revealed a well-defined, round, soft density about the size of a quarter in the right lower lobe. The lesion suggested a metastatic nodule. A roentgenogram taken six months earlier had revealed no pathology. A right lower lobectomy was performed, and histological diagnosis was papillary thyroid carcinoma, metastatic. This patient made an uneventful recovery and is now clinically asymptomatic. A recent chest roentgenogram revealed two small-sized nodules on the left side. Radioactive iodine uptake was zero. What management should be considered at this time? Is chemotherapy indicated? What is the prognosis?*

M.D., Connecticut.

Answer.—The zero uptake of radioactive iodine (I^{131}) in the neck by this patient suggests that the original operation was a total thyroidectomy. It is not stated whether the patient is currently on thyroid therapy. Such treatment could cause a low neck uptake despite persistence of thyroid tissue. Assuming the former possibility to be correct, however, and that she is not receiving thyroid, the first step in the management of this particular patient is to administer a large test dose of I^{131} ($1\ \mu c$) for measurement of retention of I^{131} at 24 hours and for scanning over the chest nodules and general body. Although the tumor is papillary, and hence would be expected to have no uptake, frequently there are follicular components in the metastases and these may be functional. Also, a complete skeletal roentgenographic survey for metastases is indicated. Retention of more than 40% of the test dose of I^{131} in this particular patient would make possible therapy with I^{131}; less would exclude this. However, it is more likely that I^{131} therapy will not be possible in view of the histology of the original tumor and its right lung metastasis. This leaves two other methods of approach: thyroid or triiodothyronine in large doses and x-radiation to the left hemithorax. It can be said immediately that no recommendation will be acceptable to all physicians in the field. This consultant would first favor thyroid or triiodothyronine for as long as the lesions improve or remain static. I^{131} therapy, if feasible, would be used next and, finally, x-ray therapy. Radiation injury to the lungs is to be avoided in either of these latter instances. The combination of thyroid and x-ray therapy might provide a more intensive approach, but any result would be difficult to interpret. Methyltestosterone therapy is useless, and other chemotherapeutic agents have not been adequately tried. The prognosis would be four to five years as an average but could be considerably longer.

VITAMIN D AND SUNBATHING

To the Editor:—*To what extent does suntanning sustained during one season of the year increase calcium absorption? Can this absorption be equated with vitamin D given orally? Can vitamin D intoxication result from sustained exposure to the sun, as beach bathers are in the habit of doing? Is kidney stone formation a special liability for those addicted to sunbathing?*

Richard B. Gross, M.D., Bronx, N. Y.

Answer.—There is no way at present of accurately measuring the amount of vitamin D formed in the human body by the action of the ultraviolet rays of the sun on the dehydrocholesterol present in the skin. Whether the vitamin D obtained from the sun would increase calcium absorption would depend on the amount of calcium in the diet. When adults are receiving only small amounts of calcium, ingestion of vitamin D neither increases the utilization of the calcium that is ingested nor decreases the requirement for calcium. While vitamin D is important in the metabolism of both calcium and phosphorus, this consultant is not familiar with any studies giving quantitative figures for this relationship. The need for vitamin D is greatest during periods of rapid growth. The need for supplemental vitamin D by vigorous adults leading a normal life appears to be minimal. According to the Food and Nutrition Board of the National Research Council (Recommended Dietary Allowances, Publication 589, 1958), "Evidence is good that vitamin D is needed throughout the growth period, but the actual requirement has not been determined accurately. It is known, however, that 400 units daily is ample for good calcium retention in children." Hypervitaminosis D results only from a prolonged, greatly excessive intake of the vitamin, and it is extremely unlikely that mere exposure to sunlight, even to the extent practiced by "sunbathers," would

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

result in anything approaching toxic levels of vitamin D. It has been shown that 100,000 international units per day in adults will result in toxic symptoms. The amount manufactured by sunlight on the skin certainly does not approach this level. This consultant is unaware of any evidence correlating sunbathing with the formation of kidney stones.

References

Bauer, W.; Marble, A.; and Claflin, D.: Studies on Mode of Action of Irradiated Ergostrol: Its Effect on Calcium, Phosphorus and Nitrogen Metabolism of Normal Individuals, J. Clin. Invest. **11**:1-19 (Jan.) 1932.

Hart, M. C.; Tourtellotte, D.; and Heyl, F. W.: Effect of Irradiation and Cod Liver Oil on Calcium Balance in Adult Human, J. Biol. Chem. **76**:143-148 (Jan.) 1928.

Hurscher, H. A.; Donelson, E.; Erickson, B. N.; and Macy, I. G.: Results of Ingestion of Cod Liver Oil and Yeast on Calcium and Phosphorus Metabolism of Women, J. Nutrition **8**:341-346 (Sept.) 1934.

Kelly, F. C., and Henderson, J. M.: Influence of Certain Dietary Supplements on Nutrition of African Native, J. Hyg. **29**:418-428 (Feb.) 1930.

McKay, H., and others: Effect of Vitamin D on Calcium Retentions, J. Nutrition **26**:153-159 (Aug.) 1943.

TREATMENT OF INSECT STINGS

To the Editor:—*Please discuss treatment of insect bites and stings in general, with special reference to bites of honey bees and red ants.*

J. M. Hesser, Benson, Ariz.

Answer.—In general, the reactions to insect bites can be treated prophylactically with repellents and symptomatically with common local antipruritic agents. Orally given antihistamines will add somewhat to the comfort. The reaction usually is self-limiting. Capturing and identifying the offending insect will assist vector control agents to institute effective measures. A few insects, especially ticks and larval forms of mites and flies, are buried in part or entirely beneath the skin surface. In a number of such instances, excision is necessary. Secondary infection may vary from a slight pustule to a large abscess, and treatment is dictated by the character of the lesion. In circumstances of repeated bites and secondary pustulation, as often occurs with flea bites, treatment with staphylococcus vaccine may reduce the unsightly residual discoloration from such infected lesions. Allergic reaction to bites, especially of the mosquito, deer fly, black fly, and flea, is treated with frequent success by "desensitization" injections of an extract made from the offending insect. The questioner is referred to an excellent article on this subject by Allington and Allington (*J. A. M. A.* **155**:240-247 [May 15] 1954).

With specific reference to the order Hymenoptera, and especially to the honey bee and red ant, the most dramatic effect is the anaphylactic reaction which is responsible for more deaths in a year than from the bite of poisonous snakes. The literature is replete with reports of these dramatic allergic incidences and descriptions of treatment wit symptomatic and specific measures. Morhous (*J. A. M. A.* **141**:193 [Sept. 17] 1949) reports o ant bites. Prince and Secrest (*J. Allergy* 10:379 1939) discuss allergic reactions to various member of this order. Treatment of the ordinary local discomfort of stings from the honey bee and the re ant has encompassed a vast number of home remedies and pharmaceuticals. Since the venom of re ant is presumed to contain an appreciable amoun of formic acid and since the stinging apparatus o the honey bee contains both acid and alkalin venom sacs, cold packs containing baking soda would provide the preferable home remedy. Cryotherapy (application of cold in the form of ice cubes or ice bag) will provide the most comfort. Since the venom sac of the honey bee is left in the victim to continue its pumping action, this should be removed—not by grasping with tweezers to promote the injection of more venom but, preferably, by scraping off with a pen knife or with the fingernail. Local applications of antipruritic ointments and orally given antihistamines may give relief from persistent discomfort.

SMOKING AND HEADACHES

To the Editor:—*A 55-year-old man has had chronic, daily headaches for approximately 10 years. The headaches are classified as the atypical vascular tension type. Ordinary drug therapy has been of no avail. The results of extensive investigations, including skull roentgenograms, electroencephalograms, cervical spine x-rays, and numerous blood studies, have been entirely within normal limits. His general physical condition and health status is otherwise unimpaired except for the presence of mild emphysema. He smokes habitually and excessively, averaging three to four packs of cigarettes per day, and has smoked this much for the past 35 years. Is it possible that nicotine in such an excessive amount could be the etiological factor in this patient's cephalgia?*

Alexander Wallace III, M.D., Los Angeles.

Answer.—It is difficult to state whether the excessive use of tobacco is the cause of this patient's headache or not. Excessive use of tobacco has been known to induce headache, insomnia, vertigo, and a variety of other symptoms. Tobacco amblyopia is observed occasionally. An individual absorbs about 2.5 to 3.5 mg. of nicotine from smoking a cigarette, and the effects are comparable to those noted after the intravenous injection of 1 mg. of nicotine. There are many agents in tobacco smoke, but the reactions to smoking can be attributed almost entirely to the nicotine content of the tobacco. The nicotine content amounts to about 2% in the average cigarette and to about 1% in so-called denicotinized preparations. Nicotine is a peripheral vasoconstricting agent. Prompt cutaneous vasoconstriction, as well as constriction of the retinal arterioles, can be demonstrated in smokers as well as in nonsmokers. Nicotine has no therapeutic value. It would be interesting to observe the patient's reactions if he stopped smoking even for only a few days. This patient probably has a so-called tension headache, and excessive smoking, like the headache itself, may be an expression of an anxiety state.

INDURATION OF CORPORA CAVERNOSA

To the Editor:—*Please give information regarding the most efficacious treatment of induration of the corpora cavernosa (Peyronie's disease).*

M. D., Louisiana.

Answer.—The treatment of induration of the corpora cavernosa has not been satisfactory in spite of the many therapeutic suggestions made in recent years. There is a long list of methods which might be tried, some of which have been reported to bring relief, but none has proved to be uniformly successful. In general, the reports have been more favorable in the early stages of the disease. When the tissue changes have gone on to extensive fibrous scar tissue with destruction of the erectile tissue or with bone formation, therapeutic measures have been less satisfactory. In recent years, injection of hydrocortisone into the fibrous plaques has been recommended even though the technical procedures employed have not always been satisfactory. Application of radium or x-ray therapy has proved beneficial in some cases, particularly in relieving any painful symptoms which may be present. In advanced cases, surgery has been advocated by Lowsley, who reported a number of permanent cures. Many of his American colleagues, however, failed to corroborate his claims. Fogh-Andersen (*Acta chir. scandinav.* 113:45, 1957) recently reported excellent results in a series of patients operated on by surgical removal of the fibrous areas according to Lowsley's techniques. It should be remembered, however, that in many cases the symptoms present will gradually become ameliorated spontaneously.

Answer.—Induration of the corpora cavernosa has been called, besides Peyronie's disease, fibrosis of the corpora cavernosa, fibrosclerosis of Buck's fascia, and chronic chordee. It is due to a fibrous infiltration of the wall of Buck's fascia which, of course, lines the venous spaces and constitutes the bodies called the corpora cavernosa. The effect of this disease is to cause a crooking of the penis when there is an erection by preventing the normal distention of the corpora cavernosa. Many things have been incriminated as being etiological factors in the development of this disease; however, none of them has been verified. The cause of the disease is not known. It is not due to syphilis, diabetes, arteriosclerosis, or any other individual lesion; neither is it associated with a gouty diathesis. The only possible factor connected with induration of the corpora cavernosa has been the occasional coexistence of Dupuytren's contracture of the hand. Since the latter condition has responded by softening with large doses of vitamin E, this has been an accepted treatment of induration of the corpora cavernosa for the past 10 or 15 years. It is true that occasionally the fibrosis or cavernositis, as it is sometimes called, will soften up and respond to the ingestion of vitamin E over a period of several months. This is usually given in the form of tocopherol acetate, 100 mg. three times a day. X-ray, radium, and other types of irradiation therapy have been used and have been reported as being somewhat helpful in a limited number of instances. The infusion of heat by use of diathermy electrodes has been tried, and the fibrosis has been softened in a few instances. More recently, with the introduction of such substances as hyaluronidase, hydrocortisone, and chymotrypsin, attempts have been made to inject the fibrosed area directly. Much has been claimed for some individual patients for this type of therapy. However, this consultant has given every one of these methods an honest opportunity, and in practically no instance has there been any improvement in the condition. Some patients have had less pain, where pain was a feature, and this is not usually the case. At the present time, it might be said that there is no efficacious treatment of this disease. Occasionally, the disease disappears or partially disappears spontaneously without any treatment whatsoever. There are some instances where history of injury to the corpora cavernosa can be elicited prior to the development of the induration. In these patients, the prognosis is usually better than in those in whom it develops insidiously without any history of trauma. Apparently, there is a resorption of the fibrotic process in the cases that follow a hemorrhage or fibrous replacement of the hemorrhagic area.

PREGNANCY AFTER MASTECTOMY

To the Editor:—*A 40-year-old woman had a radical mastectomy two years ago. She wants to have children; what advice should be given? Has a mother in a similar case successfully borne a baby?*

M.D., Minnesota.

Answer.—The problem posed by pregnancy after mastectomy is not so much a question of the ability to carry the pregnancy to a successful termination as it is a question of unfavorable effects on the ultimate prognosis of the mother. It is difficult to find data on such cases. A colleague has reported on a 45-year-old patient who was delivered of a normal baby three years after a radical mastectomy for mammary carcinoma with metastases. Five years after the birth of her child the mother was without evidence of disease. The poor prognosis of mammary carcinoma developing during pregnancy is recognized and is considered to be related to the outpouring of estrogen occurring at this time (Haagensen, Diseases of the Breast, Philadelphia, W. B. Saunders Company, 1956). However, it is now established that approximately 40-45% of patients with metastatic mammary carcinoma respond favorably for a limited period of time to female hormone therapy. There is no way of determining whether the primary breast tumor was the type which might be aggravated or the type which could be controlled by estrogen in a patient who has no evidence of tumor at this time. One might assume that the patient in question has, at the most, a 55% chance of worsening her disease and a possible chance of improving it by pregnancy. A further practical consideration, however, is the over-all prognosis for all mammary cancer patients of only a 33% five-year survival rate (Organized Clinical Investigation of Cancer, 10th Report, 1936-1953, University of Michigan). In view of these statistics one might not want to start a family.

NEPHROTIC SYNDROME

To the Editor:—*Three months ago, a man, aged 38, noticed swelling of the ankles (edema) extending to the legs. Findings on examination were normal, except for a large amount of albumin in the urine. The edema varies from time to time—sometimes more, sometimes less—but the albumin in the urine persists. Tests and results are as follows: total protein level, 4.4 Gm.%; albumin level, 2.6 Gm.%; globulin level, 1.8 Gm.%; albumin-globulin ratio, 1.5; prothrombin time, 13 seconds; prothrombin activity, 100%; Fishberg concentration test: first specimen, specific gravity 1.005, second, 1.011, and third, 1.010 (normal, at least one specimen with specific gravity of 1.025 or more); blood urea nitrogen level, 16 mg.%; and phenolsulfonphthalein excretion: first specimen (65 cc.), 45%, second (50 cc.), 25%, third (95 cc.), 7%, and fourth (40 cc.), 5%, with total dye excreted, 82% (normal, more than 60%). How should this case be managed?*

Michael Austin, M.D., Reading, Pa.

Answer.—The patient with edema, heavy proteinuria, hypoproteinemia, and normal renal function, as tested with phenolsulfonphthalein, is evidently suffering from a nephrotic syndrome. This diagnosis would be even more probable if hypercholesteremia were present. Nephrotic syndrome is usually due to chronic glomerulonephritis. More and more evidence is accumulated that nephrotic syndrome caused by chronic nephritis may develop after a severe attack of allergy due, for instance, to poison ivy, poison oak, or insect bites. In all cases of nephrotic syndrome, the possibility of amyloid of the kidney, liver puncture, systemic lupus erythematosus (search for L. E. cells), or syphilis must be investigated. In nephrotic syndrome due to glomerulonephritis or to systemic lupus erythematosus, corticosteroids may have a favorable influence. Patients with chronic glomerulonephritis often improve by a long sojourn in the desert climate.

TESTICULAR PAIN

To the Editor:—*A 42-year-old man gives a history of having a crushing injury to both testes 15 years ago. He states that intercourse proceeds normally until just before ejaculation and that he then has sharp pain in both testes and loses erection without ejaculation. He also states that after intercourse both testes are painful for a period of five days. The patient wishes information as to whether removal of both testes would allow him to have intercourse without pain. Would testosterone prevent him from developing a feminine appearance?*

Howard V. Weems, M.D., Sebring, Fla.

Answer.—Unfortunately, no mention is made of the extent of the injury to the testes. Presumably the testicular tissue is preserved, and, even though spermatogenesis may be depressed, hormone secretion is proceeding at a normal rate. In that event, it is most likely that the patient's present difficulties have no relation to the injury. Partial or complete loss of potency is not unusual at this age, being generally attributed to psychogenic disturbances rather than to hormone deficiency. The pain may be psychogenic also or may result from epididymal distention which accompanies sexual excitement without ejaculation. Castration seems to be too drastic, even if it ultimately solves the patient's problem. If operation is contemplated, bilateral epididymectomy should suffice insofar as the pain is concerned. The administration of testosterone after castration will prevent development of a feminine appearance. However, the need for continued administration of the drug, which is at best a poor substitute, leads this consultant to the conclusion that the remarkable organs which nature has provided should remain undisturbed.

PITYRIASIS VERSICOLOR

To the Editor:—*A skin biopsy of a 25-year-old man revealed pityriasis versicolor. These lesions have been present for 10 years and are slowly covering more area. At present they cover half of the trunk and arms. What is the treatment for this condition?*

M.D., Texas.

Answer.—To perform a biopsy in order to establish a diagnosis of pityriasis versicolor is to do things the hard way. The disease responds to treatment with most any fungicidal preparation, such as dilute Whitfield's ointment or mild concentrations of salicylic acid and sulphur precipitate in combination. Sponging the affected areas with 10% aqueous solution of sodium hypochlorite is effective, as is washing with selenium sulfide shampoo. With all methods, however, the condition is apt to recur.

HARELIP AND CLEFT PALATE

To the Editor:—*A patient with cleft palate and harelip, whose father also had harelip, is now married and wants to know what will help avoid this defect in his children. In a medical periodical it was stated that these conditions are due to a lack of certain vitamins. If this is true, what vitamins should be used?*

Irving S. Weinstein, M.D., New Rochelle, N. Y.

Answer.—There has been in the past some discussion about the relationship of vitamin deficiency to cleft palate and cleft lip. However, this has only been a theory which was talked about but quickly exploded. From present knowledge, there is absolutely no relationship between cleft palate and cleft lip and vitamin deficiency. The mere fact that a parent or a relative of a parent has or has had a cleft palate or cleft lip does not mean that the offspring will also be so afflicted. In the experience of the writer, approximately 65% of all persons with cleft palate and cleft lips do not have a history of a similar deformity in the family. However, one must consider that the offspring of a parent with a cleft palate or a cleft lip will have a larger chance of being born with such a deformity. There is no way known today to positively prevent children from being born with this deformity. The only thing that can safely be said is that under proper care, during the first trimester particularly, the possibilities of a normal birth are increased. There is no way to prognosticate the probability of a cleft palate or cleft lip. This consultant has seen normal children born to parents with cleft palate and/or cleft lip and vice versa. The real cause is not known at the present time.

VITILIGO

To the Editor:—*What is the possibility that a product with the following ingredients may cause vitiligo? It contains less than 4% each of isopropyl alcohol, alkyl aryl sodium sulfonate, sodium metasilicate, and sodium orthosilicate and less than 1% each of sodium tripolyphosphate, alkylphenyl of polyethylene glycol, and coloring. The product is 90% water.*

Norman W. Brickson, M.D., Beaver Dam. Wis.

Answer.—There is a noticeable percentage of individuals who possess the somewhat embarrassing characteristic of losing the skin pigment in areas which have been the seat of an inflammatory process. The degree of hypersensitivity is variable. Alkyl aryl sodium sulfonate is a member of the anionic surfactants, which are highly defatting to the skin and, thus, are potentially irritants. Sodium metasilicate and orthosilicate are strongly alkaline and, as such, may be irritating. In the presence of acid there may be formed silicic acid. Alkylphenyl of polyethelene glycol is a nonionic surfactant and is usually harmless to the skin. The method of approach in this matter would be to secure portions of solutions with the above-mentioned percentage and do patch tests. These should be repeated on the same areas if results are doubtful. As some of these agents are capable of producing a dermatitis, and inflammatory conditions produce loss of pigment at the point of contact in some individuals, the product may cause vitiligo.

SPINAL FORM OF HEREDITARY SCLEROSIS

To the Editor:—*Has corticosteroid or ACTH therapy been used in the treatment of the spinal form of hereditary sclerosis (Friedrich's ataxia)? This diagnosis was established in a brother and sister, 10 and 12 years of age, respectively, about one year ago. Incoordination and ataxia are progressing rapidly, and the children fall frequently; thus, any increased tendency to fracture would be a practical consideration. Is any organization making study of this condition in the United States?* *M.D., Michigan.*

Answer.—A rapid worsening of disability between the ages of 10 and 15 years is common in the classic type of hereditary sclerosis. No agent has yet been found to modify the course of the disease. ACTH and corticosteroids have not been tried extensively, because the pathology of the disease does not resemble that of diseases when these substances have been effective. In the few cases where ACTH or steroids have been tried, there has been no effect. No organization is known to be studying this condition in the United States, but every neurological department has studied the pathology of cases of this disease and the genetics have been extensively described. The difficulty is the absence of any clue as to the underlying defect, which probably concerns some aspect of cellular metabolism.

RECURRENT TONSIL INFECTION

To the Editor:—*Please provide information on the medical treatment of recurrent infection of cryptic tonsils.*

P. Pellegrini, M.D., Santa Marinella, Italy.

Answer.—The cheesy material that can be expressed from the crypts of the tonsils is made up of keratin from desquamated epithelium and is a normal condition which does not require treatment. In tonsils which have previously been infected, scar tissue may have sealed the crypts and small abscesses may occur in them. This condition is not known to cause any general or local symptoms of clinical importance. The only symptom that is caused by concretions in tonsillar crypts is foul-smelling breath. It has been advised that with pressure on the anterior pillar of the tonsil this material can be expressed from the crypts. This can be done whenever it is thought necessary.

MALIGNANT WITH BENIGN TUMORS

To the Editor:—*Is there any significant difference in the incidence of malignant tumors in patients afflicted with long-standing benign tumors? What difference is there in the incidence of malignant tumors of the genitalia or other parts of the body in women with chronic fibroids and in women of the same age group without fibroid or other benign tumors? These questions have no reference to the occurrence of malignant degeneration of benign tumors.*

Samuel Dessen, M.D., Chicago.

Answer.—As far as is known, there is significant difference neither in the incidence of malignant tumors in patients with benign tumors as compared with those without benign tumors nor in the frequency of malignant growths for different benign neoplasms. Likewise, there is no proof that there is an increased frequency of carcinoma in patients with leiomyoma, although in the past several gynecologists thought this was so. Intramural and subserous myomas can have no effect in producing malignancies of the endometrium, but submucous myomas which can produce disturbances in the endometrium theoretically may lead to malignancy. However, there is no definite evidence of this.

ANAPHYLAXIS DURING ANESTHESIA

To the Editor:—*Is it true that a person under general anesthesia (for example, plane 1 of stage 3) does not suffer an anaphylactic or severe allergic reaction if exposed to what, for this person, is normally strongly allergenic? Also, would it be possible as a general procedure to administer tetanus antitoxin (equine or bovine) to a patient under general anesthesia with assurance that an anaphylactic reaction would not occur?*

Tom Roe, M.D., Savannah, Tenn.

Answer.—The question is apparently prompted by reports of early observations on experimental anaphylaxis that animals in deep anesthesia could not be thrown into anaphylactic shock. Theoretically, it would appear that this should apply to humans as well, but unfortunately this is not completely true. At the most, one might obtain a subdued or delayed reaction. This is believed to be due to general muscular relaxation rather than interference with the hypersensitive mechanism. There is no assurance that equine or bovine tetanus antitoxin can be given with impunity to a sensitive individual under general anesthesia.

DEAFNESS AND USE OF EARPLUGS

To the Editor:—*A patient is gradually going deaf. For a number of years she has used a dictating machine, to which she listens through ear plugs. Is there any evidence that the long-continued use of ear plugs might lead to deafness?*

Clifford L. Graves, M.D., La Jolla, Calif.

Answer.—There have never been findings to support any loss of hearing due to long-continued use of ear plugs relating to a dictating machine. There may be irritation to the canal from the ear plugs, which in some cases leads to external otitis and edema.

PITYRIASIS ROSEA

To the Editor:—*Three girls in one family have pityriasis rosea at approximately two-year intervals. What is known of its etiology?*

Robert S. Srigley, M.D., Altus, Okla.

Answer.—The cause of pityriasis rosea is unknown. Its rapidly developing, widespread, symmetrical lesions and the conferred immunity suggest an infectious basis. Although no specific agent has been demonstrated, a viral origin seems most likely.

REMINDING PATIENTS TO OBTAIN IMMUNIZATIONS

To the Editor:—*Please give advice on the type of letter that could be sent to patients reminding them to obtain poliomyelitis immunizations.*

Timothy A. Lamphier, M.D., Boston.

Answer.—Since people often forget to start or finish the available preventive inoculation series, sending of reminders by physicians is heartily approved of. In fact, the American Medical Association has prepared two cards which physicians may use to remind patients to start or finish poliomyelitis series, and these are available free of charge. If a physician prefers to send a personal letter to his patients, he should remind them that it is time to get a second or third injection if they have already started the series or urge them to begin the series if they have not done so. Attention might be called, at present, to the Detroit epidemic, with the statement that poliomyelitis is still not completely wiped out and can spring up where people have not obtained immunization. The letter should indicate only concern with the patient's health. Also, it is suggested that the patient be told to go to "the doctor of his choice" for the injections rather than specifically to the reminding physician. It may be desirable to suggest a fourth immunization dose to patients living in an epidemic area or traveling to a place where they might need additional protection.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Health Care of Aged Remains Major Subject for Discussion . .
Consultant Group Starts on Problems of Medical Education . .
HEW Drafts Board Program to Combat Air Pollution Menace . .
"Provisional Qualification" to Be Offered Foreign M.D.'s . .

HEALTH CARE OF AGED CONTINUES AS MAJOR DISCUSSION SUBJECT

Secretary Flemming's "listening" conferences with leaders of national organizations concerned with health, education, and welfare are producing a variety of views on a major topic—the health care of the aged.

The question arose early in the first of three meetings on "health problems and emerging health needs." Surgeon General Leroy Burney conceded that there are some problems in financing the care of the aged but there may be need first for more emphasis on facilities, personnel, and administration. He cited the fact that the federal government had spent over 1 billion dollars on Hill-Burton facilities yet had expended only a little over 1 million dollars for research on facilities for various groups of patients.

Spokesmen for the American Medical Association (headed by President Gunnar Gundersen), Blue Shield, American Hospital Association, and Association of Methodist Homes and Hospitals told of numerous voluntary efforts and studies designed to solve problems of financing oldsters' medical and hospital costs. Ray Amberg, president of the A. H. A., told the conference: "We hope to solve this problem without federal aid." He had in mind bills for providing free hospital and medical care for social security beneficiaries.

Dr. Ernest B. Howard, assistant executive president of the American Medical Association, said it would be "disastrous to jump into a full program so radical" as the social security proposal. In reply to a question, he added that there was a definite neeed for government research in this field.

The need for a higher level of self-care of older people was cited by the spokesman for the Methodist homes.

CONSULTANTS STUDYING PROBLEMS OF MEDICAL EDUCATION

A committee of advisers to Surgeon General Burney is at work attempting to find an answer to the question: "How can the nation be supplied with adequate numbers of well-qualified physicians over the next decade?" The group's organization meeting was held Dec. 8 in Washington, D. C.

The new body is the outgrowth of a plan announced by Dr. Burney in October when he addressed the American College of Surgeons in Chicago. In announcing appointment of 17 members (with four to be named later), Dr. Burney said it would not be "just another study" of medical manpower, a reference to the many federal investigations and reports on this subject in the last few years. He said the consultants themselves would determine the scope of their study and methods of operation, but he suggested five possible approaches:

"Appraise existing data, plans, and proposals related to medical schools and the nation's needs for physicians.

"Identify areas of agreement and areas that require further study.

"Recommend general actions which might be taken to achieve reasonable and acceptable goals in medical manpower over the next 10 to 20 years.

"Recommend any specific actions which educational institutions, foundations, industry, local, state, and federal governments should take in meeting these goals.

"Recommend the proper role, if any, that the Public Health Service should play and the steps which it should take."

In his letters of invitation, Dr. Burney emphasized that "whether there is an absolute or relative shortage of physicians, the need for physicians will increase in the immediate future." He said the Public Health Service is concerned, as are the medical and allied professions, the leaders in education, and the public. He declared that PHS is aware of specific need for more physicians by research institutions, hospitals, state and local governments, health agencies, and industry.

Appointment of the committee, following a warm reception in the Department of Health, Education, and Welfare for the Bayne-Jones report and talks on the subject by the top officials of the department, is evidence that the administration next year will be prepared to push for enactment of some federal plan for financial assistance to medical schools.

The Bayne-Jones report proposed a tripling of the nation's spending for medical research in the next 12 years, and immediate start on between 14 and 20 new medical schools.

Chairman of the consultants group is Frank Bane, former executive secretary of the Council of State Governments. He has been active in public affairs for more than 30 years. The 17 appointments announced are:

Ward Darley, M.D., Executive Director, Association of American Medical Colleges; Edward L. Turner, M.D., Secretary, Council on Medical Education and Hospitals, American Medical Association; Edwin L. Crosby, M.D., Director, American Hospital Association; Miss Marion W. Sheehan,

(Continued on next page)

"If one digitalis agent were to be recommended for its adaptability to the many and varied clinical contingencies, we believe Digoxin would be [a] drug of choice."

Lown, B., and Levine, S. A.:
Current Concepts in Digitalis Therapy, Boston,
Little, Brown & Company, 1954, p. 23, par. 2.

Associate General Director, National League for Nursing; Harold Hillenbrand, D.D.S., Secretary, American Dental Association; Vernon W. Lippard, M.D., Dean, School of Medicine, Yale University; Dr. Harold L. Enarson, Executive Director, Western Interstate Commission for Higher Education, Boulder, Colo.; John McK. Mitchell, Dean, School of Medicine, University of Pennsylvania; Isidor S. Ravdin, M.D., Vice-president, Medical Affairs, University of Pennsylvania; Emory W. Morris, D.D.S., LL.D., President, W. K. Kellogg Foundation, Battle Creek, Mich.; Mr. Douglas E. H. Williams, Executive Secretary, Dunbar Community Association, Inc., Ann Arbor, Mich.; Morris Thompson, ScD., President, Kirksville College of Osteopathy and Surgery, Kirksville, Mo.; Julian P. Price, M.D., A. M. A. Trustee, Florence, S. C.; Fred C. Cole, Ph.D., Academic Vice-president, Tulane University; Clayton G. Loosli, M.D., Dean, School of Medicine, University of Southern California, Los Angeles; and Charles E. Smith, M.D., Dean, School of Public Health, University of California, Berkeley, Calif.

U. S. MAPS CAMPAIGN AGAINST AIR POLLUTION

As a follow-up on the National Conference on Air Pollution, the Department of Health, Education, and Welfare has announced plans for legislative proposals, stepped-up research, and formation of a study group, all aimed at combatting air pollution.

Secretary Flemming outlined first what he described as a constructive step in dealing with interstate air pollution problems. Congress should give consideration to allowing the federal government to hold hearings and make findings and recommendations where interstate problems are involved, he said.

The Robert A. Taft Sanitary Engineering Center at Cincinnati is launching a number of research studies in the auto exhaust problem. They include (1) construction of two irradiation chambers which will study the action of sunlight on automobile exhausts as basis for determining health effects of irradiated gases, (2) starting after the first of the year animal experiments on the effect of auto exhausts, and (3) studies using precise measurements of effects of exhaust on plants and bacteria.

A third development will be calling together of a group representing industry, state and local governments, universities, and other research groups. Their job would include working out practical methods of carrying out conference proposals in medical and engineering research. They also will be asked to indicate what should be a "fair share" for federal, state, and local governments and for industry and other private groups.

NATION'S MILK SUPPLY CONTINUES FREE OF DANGEROUS RADIATION

Despite continuation of nuclear weapons testing, the nation's milk supply still does not have a dangerously high level of radioactivity.

This is the report from Public Health Service, based on tests made during August at 10 sampling stations scattered across the country.

A decline in strontium-90 levels, as compared with July testing, was recorded in milksheds serving Austin, Cincinnati, Fargo, N. D., New York City, Salt Lake City, and St. Louis, Mo. Slight increases were reported for milksheds serving Atlanta, Chicago, and Sacramento, Calif.

Tests for four other specific radioactive elements in milk—iodine-131, strontium-89, barium-140, and cesium-137—showed variations not only among sampling stations but also among samples taken from the same stations. However, in no case was a permissible level exceeded.

Samples are analyzed at the PHS Robert A. Taft Sanitary Engineering Center at Cincinnati. The operation takes more than six weeks.

QUALIFICATIONS TO BE EASED FOR FOREIGN DOCTORS

After a year's experiment, the group in charge of examining foreign-educated physicians for internships and residency appointments has decided to set up a "provisional qualification" for applicants who come within five points of the passing grade of 75.

Dr. Dean F. Smiley of Evanston, Ill., executive director of the Educational Council for Foreign Medical Graduates, made a progress report on the new program at the clinical session of the District of Columbia Medical Society. He presented this information:

In the first tests last spring, 298 applicants were examined. Of these, 152 (51%) made passing grades of 75 or better and another 50 (17%) rated between 70 and 74. The most recent examinations, in September, found 318 of the 844 applicants passing and 225 scoring 70 to 74. Next examinations are scheduled for February, with 2,300 applications already received.

Under the new procedure, those finishing between 70 and 74 will be allowed to take internships or residencies for two years. After this period they may take the examination again if they wish to stay in the United States longer.

Objective of the testing program, Dr. Smiley explained, is to guard against medical imposters, cult practitioners, and other untrained or inadequately trained foreign medical graduates being admitted to American hospitals and American medical practice.

Dr. Smiley said one of the developments of the last year was the effort of a number of foreign countries to induce their nationals to return when they had finished their internships and residencies, rather than take up medical practice in the United States.

MISCELLANY

Most recent tabulation by the Housing and Home Finance Agency shows a total of almost 2 million dollars in loans awarded for projects in the health fields. They are $550,000 for a water distribution system in the Good Hope, Calif., area; $277,000 for a water system in Wood River Township, Ill.; $40,862 to plan a sewage disposal system in Pen Argyl, Pa.; $563,000 to help build a student nurse dormitory at Albany Hospital, Albany, N. Y.; and $366,000 to help finance a student nurse dormitory at Children's Hospital, Columbus, Ohio.

one
glycoside
consistently
reliable for

- routine or emergency digitalization
- long-term maintenance

with the added benefits of

- early gastrointestinal warnings of over-digitalization
- short duration of toxicity if over-digitalization occurs

'LANOXIN' TABLETS
0.25 mg. scored (white)
0.5 mg. scored (green)

'LANOXIN' INJECTION
0.5 mg. in 2 cc. (I.M. or I.V.)

'LANOXIN' ELIXIR PEDIATRIC
0.05 mg. in 1 cc.

'LANOXIN'®
brand
DIGOXIN

formerly known as Digoxin 'B.W. & Co.'

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, New York

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. F. J. L. Blasingame, 535 North Dearborn St., Chicago 10, Executive Vice President
1959 Annual Meeting, Atlantic City, June 8-12.
1959 Clinical Meeting, Dallas, Texas, Dec. 1-4.
1960 Annual Meeting, Miami Beach, Fla., June 13-17.
1960 Clinical Meeting, Washington, D. C., Nov. 29-Dec. 2.
1961 Annual Meeting, New York City, June 26-30.
1961 Clinical Meeting, Denver, Nov. 28-Dec. 1.

AMERICAN

1959

January

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS, Palmer House, Chicago, Jan. 24-29. Dr. Clinton L. Compere, 720 N. Michigan Ave., Chicago 11, Secretary.
AMERICAN COLLEGE OF SURGEONS, Sectional Meeting, Francis Marion Hotel, Charleston, S. C., Jan. 19-21. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.
AMERICAN PROTESTANT HOSPITAL ASSOCIATION, Jefferson Hotel, St. Louis, Jan. 27-30. Mr. Leo M. Lyons, 105 W. Adams St., Chicago, Executive Director.
AMERICAN SOCIETY FOR SURGERY OF THE HAND, Palmer House, Chicago, Jan. 23-24. Dr. George S. Phalen, 2020 E. 93d St., Cleveland 6, Secretary.
INTERNATIONAL COLLEGE OF SURGEONS, SOUTHEASTERN REGIONAL MEETING, Miami Beach, Fla., Jan. 4-7. Dr. Harold O. Hallstrand, 7210 Red Road, South Miami, Fla., Chairman.
INTERNATIONAL MEDICAL ASSEMBLY OF SOUTHWEST TEXAS, Gunther Hotel, San Antonio, Tex., Jan. 26-28. Mr. S. E. Cockrell Jr., 202 W. French Pl., San Antonio, Tex., Executive Secretary.
NATIONAL ASSOCIATION OF METHODIST HOSPITALS AND HOMES, Sheraton-Jefferson Hotel, St. Louis, Jan. 27-29. Mr. Olin E. Oeschger, 740 Rush St., Chicago 11, General Secretary.
ROCKY MOUNTAIN TRAUMATIC SURGICAL ASSOCIATION, Aspen, Colo., Jan. 28-31. Dr. Charles B. Bartell, 1600 Orange Ave., Long Beach 13, Calif., Secretary.
WESTERN SOCIETY FOR CLINICAL RESEARCH, Carmel-by-the-Sea, Calif., Jan. 29-31. Dr. William N. Valentine, University of California Medical Center, Los Angeles 24, Secretary.

February

AMERICAN ACADEMY OF ALLERGY, Morrison Hotel, Chicago, Feb. 9-11. Dr. Bram Rose, Royal Victoria Hosp., Montreal, Quebec, Secretary.
AMERICAN ACADEMY OF FORENSIC SCIENCES, Drake Hotel, Chicago, Feb. 26-28. Dr. Walter J. R. Camp, 1853 W. Polk St., Chicago 12, Secretary.
AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE, Boston, Feb. 11-13. Dr. L. Blaney, 1608 Walnut St., Philadelphia 3, Secretary.
AMERICAN COLLEGE OF RADIOLOGY, Drake Hotel, Chicago, Feb. 6-7. Mr. William C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Director.
AMERICAN COLLEGE OF SURGEONS, SECTIONAL MEETING, Shamrock Hilton Hotel, Houston, Texas, Feb. 2-4. Dr. J. Griffin Heard, 6410 Fannin St., Houston 25, Texas, Chairman.
AMERICAN COLLEGE OF SURGEONS, Sectional Meeting, Hotel Vancouver, Vancouver, B. C., Feb. 26-28. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.
ASSOCIATION OF CLINICAL SCIENTISTS, Scientific Session, Mobile, Ala., Feb. 27-28. Dr. Earl B. Wert, Mobile Infirmary, Mobile, Ala., Chairman.
CALIFORNIA MEDICAL ASSOCIATION, Sheraton-Palace Hotel, San Francisco, Feb. 22-25. Mr. John Hunton, 450 Sutter St., San Francisco 8, Executive Secretary.
COLORADO STATE MEDICAL SOCIETY, Midwinter Clinical Session, Shirley-Savoy Hotel, Feb. 17-20. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.
CONGRESS ON INDUSTRIAL HEALTH, Netherland Hilton Hotel, Cincinnati, Feb. 16-18. Dr. B. Dixon Holland, 535 N. Dearborn St., Chicago 10, Secretary.

March

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Baranof Hotel, Juneau, March. Dr. Robert B. Wilkins, 1121 Fourth Ave., Anchorage, Secretary.
AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION, The Homestead, Hot Springs, Va., Mar. 8-9. Dr. F. Johnson Putney, 1712 Locust St., Philadelphia 3, Secretary.
AMERICAN COLLEGE OF ALLERGISTS, Fairmont Hotel, San Francisco, Mar. 15-20. Dr. M. Coleman Harris, 450 Sutter St., San Francisco, Secretary.
AMERICAN COLLEGE OF SURGEONS, Sectional Meeting for Surgeons and Nurses, Kiel Auditorium, St. Louis, Mar. 9-12. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.
AMERICAN LARYNGOLOGICAL ASSOCIATION, The Homestead, Hot Springs, Va., Mar. 8-9. Dr. James H. Maxwell, University Hospital, Ann Arbor, Mich., Secretary.
AMERICAN LARYNGOLOGICAL, RHINOLOGICAL & OTOLOGICAL SOCIETY, The Homestead, Hot Springs, Va., Mar. 10-12. Dr. C. Stewart Nash, 708 Medical Arts Bldg., Rochester 7, N. Y., Secretary.
AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, Sheraton-Palace Hotel, San Francisco, Mar. 30-Apr. 1. Dr. Marion F. Langer, 1790 Broadway, New York 19, Executive Secretary.
AMERICAN OTOLOGICAL SOCIETY, The Homestead, Hot Springs, Va., Mar. 13-14. Dr. Lawrence R. Boies, University Hospital, Minneapolis 14, Secretary.
MICHIGAN ACADEMY OF GENERAL PRACTICE, POST-GRADUATE C Sheraton-Cadillac Hotel, Detroit, Mar. 4. Dr. F. P. Rhoades, 970 cabees Bldg., Detroit 2, Convention Manager.
NATIONAL HEALTH COUNCIL, Palmer House, Chicago, Mar. 17-19. M Philip E. Ryan, 1790 Broadway, New York 19, Executive Director.
NATIONAL MULTIPLE SCLEROSIS SOCIETY, New York, Mar. 9. Mr. Donal Vail, 257 4th Ave., New York 10, Secretary.
SOUTHEASTERN SURGICAL CONGRESS, Deauville Hotel, Miami Beach, Fl Mar. 9-12. Dr. Benjamin T. Beasley, 45 Edgewood Ave., S. E., Atla 3, Ga., Secretary.
SOUTHWESTERN SURGICAL CONGRESS, New Brown Palace Hotel, Denv Mar. 30-Apr. 1. Dr. C. M. O'Leary, 1213 Medical Arts Bldg., Oklaho City, Okla., Secretary.

April

AERO MEDICAL ASSOCIATION, Hotel Statler, Los Angeles, Apr. 27-29. I Thomas H. Sutherland, P. O. Box 26, Marion, Ohio, Secretary.
ALABAMA, MEDICAL ASSOCIATION OF THE STATE OF, Birmingham, A 9-11. Mr. William A. Dozier, 17 Moulton Bldg., Montgomery, Executi Secretary.
AMERICAN ACADEMY OF GENERAL PRACTICE, San Francisco, Apr. 6 Mr. Mac F. Cahal, Wolker Blvd., at Brookside, Kansas City 12, M Executive Secretary.
AMERICAN ACADEMY OF NEUROLOGY, Statler Hotel, Los Angeles, Apr. 1 18. Dr. Joseph M. Foley, Boston City Hosp., Boston, Secretary.
AMERICAN ASSOCIATION OF ANATOMISTS, Seattle, Apr. 1-3. Dr. B. Flex Univ. of Pa., Med. School, Philadelphia 4, Secretary.
AMERICAN ASSOCIATION FOR CLEFT PALATE REHABILITATION, Shera Hotel, Philadelphia, Apr. 30-May 2. Dr. D. C. Spriestersbach, U Hosps., Iowa City, Ia., Secretary.
AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS, Seaview Cou Club, Absecon, N J., Apr. 15-17. Dr. William J. Engel, 2020 E. 9 St., Cleveland 6, Secretary.
AMERICAN ASSOCIATION OF IMMUNOLOGISTS, Atlantic City, N. J., Apr. 17. Dr. Calderon Howe, 630 W. 168th St., New York 32, Secretary
AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS, Some Hotel, Boston, Apr. 23-25. Dr. Russell L. Holman, 1542 Tulane A New Orleans 12, Secretary.
AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chic Apr. 16-18. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago Secretary.
AMERICAN ASSOCIATION FOR THE STUDY OF NEOPLASTIC DISEASES, H Greystone, Gatlinburg, Tenn., Apr. 30-May 4. Dr. Bruce H. Sisler, 268, Gatlinburg, Tenn., Secretary.
AMERICAN ASSOCIATION FOR THORACIC SURGERY, Statler Hotel, Los geles, Apr. 21-23. Dr. Hiram T. Langston, 7730 Carondelet Ave., *Louis 5, Secretary.*
AMERICAN COLLEGE OF OBSTETRICIANS & GYNECOLOGISTS, Traymore Ho Atlantic City, N. J., Apr. 5-9. Dr. John C. Ullery, 15 S. Clark St., C cago 3, Secretary.
AMERICAN COLLEGE OF PHYSICIANS, Conrad Hilton Hotel, Chicago, A 20-24. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Execu Secretary.
AMERICAN COLLEGE OF SURGEONS, Sectional Meeting for Surgeons Nurses, The Queen Elizabeth Hotel, Montreal, Quebec, Apr. 6-9. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.
AMERICAN GOITER ASSOCIATION, Chicago, Apr. 30-May 2. Dr. John McClintock, 149½ Washington Ave., Albany, N. Y., Secretary.
AMERICAN PHYSIOLOGICAL SOCIETY, Atlantic City, N. J., Apr. 12-16. Ray G. Daggs, 9650 Wisconsin Ave., Washington, D. C., Execu Secretary.
AMERICAN PSYCHIATRIC ASSOCIATION, Civic Auditorium, Philadelp Apr. 27-May 1. Dr. C. H. Hardin Branch, 156 Westminster Ave., Lake City, Secretary.
AMERICAN RADIUM SOCIETY, The Homestead, Hot Springs, Va., Apr. Dr. Robert L. Brown, Robert Winship Clinic, Emory University, lanta 22, Ga., Secretary.
AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, Atlantic City, N. J., 13-18. Dr. F. W. Putnam, Univ. of Fla. Medical School, Gainesv Fla., Secretary.
AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY, Atlantic City, N Apr. 13-18. Dr. J. F. A. McManus, Univ. of Alabama Medical Ce Birmingham 3, Ala., Secretary.
AMERICAN SOCIETY OF INTERNAL MEDICINE, Conrad Hilton Hotel, cago, Apr. 19. Dr. Clyde C. Greene Jr., 350 Post St., San Francisc Assistant Secretary.
AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERA TICS, *Atlantic City*, N. J., Apr. 13-17. Dr. Harold Hodge, Univ Rochester, Rochester 20, N. Y., Secretary.
AMERICAN SOCIETY FOR THE STUDY OF STERILITY, Shelburne Hotel, lantic City, N. J., Apr. 3-5. Dr. Herbert H. Thomas, 920 S. 19th Birmingham 5, Ala., Secretary.
AMERICAN SURGICAL ASSOCIATION, Fairmont Hotel, San Francisco, 15-17. Dr. W. A. Altemeier, Cincinnati Gen. Hospital, Cincinnati Secretary.
AMERICAN UROLOGICAL ASSOCIATION, *Chalfonte-Haddon* Hall, Atl City, N. J., Apr. 20-23. Dr. Samuel L. Raines, 188 S. Bellevue B Memphis, Tenn., Secretary.
AMERICAN VENEREAL DISEASE ASSOCIATION, Johns Hopkins Univer Baltimore, Apr. 27-28. Dr. S. Ross Taggart, 1325 Upshur St., N Washington 11, D. C., Secretary-Treasurer.
ARIZONA MEDICAL ASSOCIATION, San Marcos Hotel, Chandler, Apr. May 2, Dr. Leslie B. Smith, 826 Security Bldg., Phoenix, Secretar
ARKANSAS MEDICAL SOCIETY, Goldman Hotel, Ft. Smith, Apr. 13-15. Paul C. Schaefer, 215 Kelley Bldg., Ft. Smith, Executive Secretar
CONNECTICUT STATE MEDICAL ASSOCIATION, Hamden High School, H den, Apr. 28-30. Dr. William R. Richards, 160 St. Ronan St., Haven, Executive Secretary.
HAWAII MEDICAL ASSOCIATION, Hilo, Apr. 23-25. Mr. Lee McCaslin, S. Beretania St., Honolulu 13, Executive Secretary.

(Continued on page 44)

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 15

CHICAGO, ILLINOIS

COPYRIGHT, 1958, BY AMERICAN MEDICAL ASSOCIATION

DECEMBER 13, 1958

COMPLICATIONS OF ENDOTRACHEAL INTUBATION

William Hamelberg, M.D., C. Merle Welch, M.D., John Siddall, M.D.
and
Jay Jacoby, M.D., Columbus, Ohio

Complications occurring after endotracheal intubation for general anesthesia were studied in 1,932 patients with special reference to the possibility of reducing postintubation symptoms by the topical use of hydrocortisone. This was added to the lubricant applied to the endotracheal tube in 322 patients. They were compared with 734 patients who received the lubricant without the hydrocortisone. A similar comparison was made between 670 patients who received the hydrocortisone topically in an aqueous medium and 206 patients who received the same medium (by spraying into the oropharynx and by instillation into the trachea) without the hydrocortisone. No serious complications occurred in any of these patients. Complaints referred to the throat, when endotracheal intubation could be the only source for complaint, were spontaneously mentioned by 28% of the patients, and questioning elicited such complaints from an additional 17%. No significant difference was found between the patients who received hydrocortisone and those who did not.

INTUBATION of the trachea is a procedure of great value. It provides assurance of a clear airway and prevents the entry of foreign material into the tracheobronchial tree. Many advances in both surgery and anesthesia have been made possible by its use. Because the technique is so valuable, this study was conducted to determine the frequency with which intubation results in complications and whether the incidence of complications could be decreased.

Among the factors which may limit the use of endotracheal intubation are complications due to the inexperience of the anesthetist and those due to the presence of the foreign body. Prolonged induction, trauma, and hypoxia during attempts to intubate have largely been eliminated as increasing numbers of skilled anesthetists have become available. The rapidly acting anesthetic and muscle relaxing agents permit the skilled operator to induce anesthesia and to insert the endotracheal tube in a minimum of time and without trauma. Coughing and straining after intubation can be minimized, and bacterial contamination need not be a major problem. The use of a local anesthetic by spray, transtracheal injection, or in the lubricant on the endotracheal tube reduces the depth of anesthesia required for tolerance of the tube. The late post-

---

From the Department of Surgery, Division of Anesthesiology, Ohio State University.
Read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

operative complications, principally laryngeal granulomas, are quite rare and are not a significant deterrent to the use of the technique.

The complications of most concern to the patient, the surgeon, and the anesthetist are those which may be manifest during the first few days after intubation. These may be caused by trauma, infection, edema, and inflammatory reaction. The patient notices symptoms which include difficulty in swallowing, sore throat, hoarseness, and aphonia. On rare occasions, the anatomic changes may be so great as to cause respiratory obstruction and require tracheotomy for relief. Such serious reactions occur more often in children than in adults and may be associated with infection or a tightly fitting endotracheal tube.

There are many articles which call attention to the alarming consequences of intubation and occasional fatalities. The latter, fortunately, are very rare. The incidence of complications ranges from 1.6 to 100%.[1]

TABLE 1.—*Age Distribution of Patients Who Underwent Endotracheal Intubation*

Age, Yr.	Treatment with Hydrocortisone, No.	Controls, No.	Total
5-9	6	28	34
10-19	49	82	131
20-29	112	141	253
30-39	155	164	319
40-49	178	167	345
50-59	216	155	367
60-69	192	149	343
70-79	69	48	117
80-89	13	10	23
Total	992	940	1,932

Among the considerations in the prevention of complications are the use of sterilized tubes and the avoidance of trauma, excessively large tubes, irritation by chemical sterilizing agents, and allergic reaction to lubricants.[2]

Interest in a possible means of reducing the incidence of complications was aroused after an experience with a difficult case. The patient was an elderly woman who had had a somewhat traumatic intubation for a laparotomy and who developed hoarseness, sore throat, and mild respiratory obstruction in the postoperative period. At the time when these symptoms were at their height, she developed a dehiscence. Because she had just eaten lunch and because she refused regional anesthesia, endotracheal intubation was mandatory for the second operative procedure. Anesthesia, intubation, and operation were uneventful. An attempt was made to prevent further laryngeal edema by the use of hydrocortisone as a preoperative laryngeal spray and by postoperative inhalation of a nebulized solution. The results were gratifying in that her already existing symptoms did not become worse; on the contrary, they disappeared more rapidly than expected.

Since one of the principal actions of hydrocortisone is the reduction of edema and inflammatory reaction, it was postulated that this substance might be useful in preventing the complications which follow endotracheal intubation.

Method of Study

Two groups of patients were studied, comprising most of the patients who had intubation during one-year period. Not included are patients i whom intubation was done when the recover room was closed (since the records were kep there) or who left the hospital before a postoperative interview could be obtained. The endotracheal tubes were of the red rubber variety. After use, the tubes were washed with hexachlorophene (pHiso-Hex) and water and then autoclaved and stored on open shelves. They were considered to be clean but not sterile at the time of their next use. Intubation was done by about 30 individuals ranging in skill from beginning residents to senior staff. MacIntosh laryngoscopes were used in almost all cases.

The total number of patients in this study was 1,932. Male and female patients were approximately equal in number. The majority of patients were between the ages of 20 and 70 years. The age distribution is indicated in table 1.

In the first group, comprising 1,056 patients, hydrocortisone was used in a 1% concentration in a 5% lidocaine (Xylocaine) hydrochloride ointment; this was applied to the endotracheal tube before insertion. In the second group, comprising 876 patients, a 2% solution of hydrocortisone in isotonic sodium chloride solution was used. Two cubic centimeters was instilled into the trachea prior to the removal of the endotracheal tube and 3 cc. sprayed into the oral pharynx with a no. 15 DeVilbiss atomizer. In each group, control studies were carried out with use of similar ointment or isotonic sodium chloride solution without the addition of hydrocortisone.

The patients were visited daily for the first three days or longer by a single individual in the first study and by two individuals in the second study. None of the personnel associated with intubation, instillation of solution, or postoperative visits was aware of the nature of the material which was used for any patient. The data obtained were recorded on mimeographed sheets and transferred to IBM cards, which were then sorted into control and experimental categories.

During the postoperative visits in the lubricant study, the patients were not specifically informed of the study or questioned about their symptoms. During the interviews, there were general conversations regarding the patients' physical condition. If a patient volunteered that he had symptoms referable to his throat or his voice, detailed questions were asked about the nature of the difficulty. In the hydrocortisone solution study, patients were informed that intubation had been done and were specifically asked about any symptoms referable to the throat or the voice.

Results

Predisposing Causes.—There are many reasons why patients might have symptoms referable to the throat. Some had preexisting upper respiratory infection with cough, sore throat, hoarseness, or sinusitis. Many had symptoms from the nasogastric tube inserted prior to surgery. Many had operative procedures in adjacent areas, including tonsillectomy, thyroidectomy, neck dissection, and other operations within the oral or pharyngeal cavities. Three of every five patients had these predisposing causes for symptoms referable to the throat. Among these, symptoms arose in 53%. Among the patients who did not have predisposing causes, symptoms arose in only 37%.

Influence of Direct Questioning.—In order to obtain more significant information about the incidence of postintubation symptoms, the patients were divided into categories of those who had predisposing causes and those in whom the endotracheal intubation was the only obvious cause for symptoms.

Twenty-eight per cent of the patients who were not questioned specifically about their throat or voice (the lubricant group) mentioned that they had symptoms. Forty-five per cent of the patients who were informed that intubation had been done and who were questioned about symptoms (the solution group) gave positive replies. A similar difference occurred in the control group; 35% complained spontaneously and 49% complained if asked (table 2).

Effect of Hydrocortisone.—Among the patients who had predisposing causes for symptoms referable to the throat, the use of hydrocortisone either in the lubricant or in the solution made little difference in the incidence of symptoms. Among those patients who had no predisposing cause for symptoms, the use of the hydrocortisone solution made little difference. When the hydrocortisone lubricant was used, however, the incidence of symptoms after intubation diminished from 35 to 26% (table 3).

Table 2.—*Incidence of Postintubation Symptoms in Patients with No Predisposing Causes*

	Route of Intubation	Patients, No.	Symptoms Present	
			No.	%
No leading questions (lubricant group)	Oral	346	93	27
	Nasal	90	26	29
Total		436	119	28
Leading questions (solution group)	Oral	243	106	42
	Nasal	206	100	48
Total		449	206	45

Other Interesting Findings.—There was no difference in the incidence of symptoms for patients intubated by first-year residents, second-year residents, or staff anesthetists. This was probably due to the fact that most intubations done by the staff were those which the residents were unable to complete because of inexperience or technical difficulty. Patients in whom intubation was done by staff members, therefore, had already been subjected to some degree of trauma. For the entire group, easy intubation was followed by symptoms in 45% of the patients, whereas difficult intubation was followed by symptoms in 54% of the patients.

Table 3.—*Influence of Hydrocortisone on Postintubation Symptoms*

	No Predisposing Causes			Predisposing Causes		
	Patients, No.	Symptoms Present		Patients, No.	Symptoms Present	
		No.	%		No.	%
Hydrocortisone lubricant	148	38	26	171	72	41
Control lubricant	288	81	35	446	206	46
Hydrocortisone solution	331	150	45	339	223	66
Control solution	118	58	49	88	55	63

The route of intubation had some bearing on the incidence of symptoms. Nasal intubation tended to be used more often with patients who had operations on the neck and within the throat. Since these operations predispose to the development of symptoms, disproportionate figures are obtained if only these patients are considered. Table 2 indicates the incidence of symptoms and the routes of intubation in those patients who had no predisposing causes. In the lubricant study, all routes of intubation produced approximately the same proportion of symptoms. In the solution study there were symptoms in 48% of patients in whom nasal intubation was done and in 42% in whom the oral route was used.

Comment

How often do symptoms develop after endotracheal intubation? Some surgeons believe that every patient with a sore throat after operation has it because of the intubation. It has been found in some instances that a sore throat is ascribed to intubation even when intubation has not been done.

There is a wide divergence in the reports of incidence of complications. This, of course, stems from the fact that various observers do not use the same criteria in determining whether a complication exists. In this study, the factor of individual variability in interpretation was kept to a minimum by having all interviews conducted by a single individual in one group of patients and by two individuals in the other group. In addition, no effort was made to eliminate slight, as compared to moderate, degrees of discomfort. Had the postoperative observations been carried out by the persons who actually performed the intubation, about 30 different observers would have been involved.

Patients who were already complaining about sore throat and hoarseness when they arrived in the operating rooms, or whose operations would normally produce such symptoms regardless of whether intubation was done or not, comprised over half of the entire series (61%). Three of every five patients either had, or might be expected to get, symptoms regardless of whether intubation was done. These individuals had a higher incidence of postoperative symptoms (53%) than the others (37%).

The incidence of symptoms after intubation in this study is probably higher than would be encountered in nonteaching institutions. In particular, the incidence of symptoms after nasal intubation is higher because many of the workers were just learning the technique and it was used to a large extent for head and neck surgery.

It is important that in practically all patients the symptoms were an annoyance rather than a significant complication. Many patients were troubled so little that they did not mention the symptoms unless specifically asked about them. When the patients were informed that intubation had been done and when they were specifically questioned about symptoms referable to the throat, the number of complaints significantly increased (45% compared to 28%). Differences of similar magnitude appear between the control groups in which no medication was used (table 3). Neither signs nor symptoms of respiratory obstruction occurred in any patient. Severe respiratory obstruction due to intubation is so rare in adults that in this institution during the past 11 years tracheotomy has not been required.

The use of hydrocortisone topically, by instillation into the trachea, by spray into the pharynx, or as a lubricant on the endotracheal tube produced no statistically significant change in the incidence of symptoms. Hydrocortisone solution is rapidly absorbed from mucous membranes. In a lubricant on the endotracheal tube, the topical effect is also rather brief. When applied in this way, however, there was a reduction in the incidence of symptoms from 35% to 26%. Although not statistically significant, this suggests that more prolonged topical application of hydrocortisone might have a more marked effect. Further studies are planned with more prolonged topical application.

Summary

The topical use of hydrocortisone has been studied as a means of reducing postintubation symptoms referable to the throat. No statistically significant changes in the incidence of symptoms followed the topical application of hydrocortisone

Predisposing causes for symptoms referable t
the throat were present in 61% of patients in whon
intubation was done. Almost two-thirds of the pa
tients who developed symptoms in the postoperativ
period had factors other than intubation which ma
have been responsible. These included preexistin
respiratory infections, nasogastric tubes, and opera
tions in the area.

No serious complications were encountered i
more than 1,900 intubations. In many instance
postintubation complications were so mild that p
tients did not mention them. The presence of sym
toms was stated voluntarily by 28% of patients;
response to questioning 45% of patients gave
affirmative reply.

This study was supported by a grant from the Upjo
Company.

References

1. (*a*) Baron, S. H., and Kohlmoos, H. W.: Laryng
Sequelae of Endotracheal Anesthesia, Ann. Otol. Rhin.
Laryng. **60:**767-792 (Sept.) 1951. (*b*) Collins, V. J., a
Granatelli, A.: Anesthesia for Tonsillectomy in Childr
Endotracheal Technique, with Cardiovascular Observatio
J. A. M. A. **161:**5-9 (May 5) 1956. (*c*) Donnelly, W.
Grossman, A. A.; and Grem, F. M.: Local Sequelae
Endotracheal Anesthesia as Observed by Examination
100 Patients, Anesthesiology **9:**490-497 (Sept.) 1948. (
Pender, J. W.: Endotracheal Anesthesia in Children:
vantages and Disadvantages, ibid. **15:**495-506 (Sept.) 19

2. Smith, R. M.: Prevention of Tracheitis in Child
Following Endotracheal Anesthesia, Anesth. & Analg.
102-112 (March-April) 1953. Reference 1*d*.

HAZARD OF CARBON DIOXIDE.—Two instances of severe reactions to high concentrations of carbon dioxide re-emphasize the fact that this gas can be dangerous because it produces effects rapidly and is more than a simple asphyxiant. These incidents involved near-collapse of aircrew members on a cargo aircraft transporting frozen foods with 12,000 and 7,400 pounds of dry ice, respectively. Some countries require that dry ice transported in aircraft be in a closed container vented to the outside. A more practical approach is being made by the Military Air Transport Service through the utilization of industrial hygiene engineering studies to determine safe dry ice loadings for all type aircraft based on a threshold limit value of 0.5 per cent carbon dioxide.—Col. J. B. Nuttall, Toxic Hazards in the Aviation Environment, *The Journal of Aviation Medicine*, September, 1958.

STERILITY AND INFERTILITY—MEDICAL VIEWS

Melvin R. Cohen, M.D., Chicago

Many of the factors involved in sterility are still unknown, but, when married couples desire children, diagnostic surveys are frequently successful. Careful diagnosis is essential to good treatment, but for some reason pregnancy sometimes follows the diagnostic survey before treatment is begun. Attention must be given to both partners. Each must have a physical examination, and laboratory procedures such as semen analysis may be necessary in addition to special procedures such as tubal patency tests and culdoscopy. The diagnosis, though sometimes difficult, occasionally reveals a situation that is obviously remediable by medicine or operation. The roles played by various hormones in pregnancy tests, in the induction of ovulation, in controlling sperm-production, and in preventing fetal wastage need to be better understood and more fully utilized.

Just as highly fertile couples desire methods of family limitation, so childless couples desire help for their infertility. The demand by the infertile couple for medical aid is growing, and, despite gaps in our knowledge of human reproduction, much can be achieved.

The stress of modern civilization has been blamed for the apparent high incidence of infertility. For the exact incidence of involuntary sterility, we must consult the demographers. Tietze[1] quotes Louis Henry (census of England and Wales, 1911) that, at the age of 20, 3% of wives are sterile; at the age of 30, 12%; and at the age of 40, 32%. Tietze in his study of the Hutterites showed that 1 in 10 ceased to reproduce at the age of 35, 1 in 3 by the age of 40, and 7 in 8 by the age of 45.

Guttmacher[2] showed that, in rural Quebec, Canada, where birth control probably is not used, the percentage of childless marriages increased with the age of the wife at the time of marriage. In the 25-29 year age group, for example, 10.2% of marriages were childless, and in the 30-34 year age group 16.2% were childless. He further reported that, even in fecund couples with planned pregnancies, 10% required more than a year to conceive.

Medically approved birth control measures will not induce sterility but will delay the possibility of conception to an older, less fertile age group.

In order to understand some of the problems of human infertility, let me review the physiology of reproduction and my diagnostic survey of the infertile couple.

Physiology of Reproduction

The physiology of reproduction is illustrated in figure 1. The anterior lobe of the pituitary gland secretes a hormone known as follicle-stimulating hormone (FSH). This hormone acts on the ovary to stimulate the growth of perhaps 10 or more follicles. For some unknown reason, all but one of these follicles become smaller and undergo certain changes, which are called atresia. The remaining follicle enlarges and becomes ripe (the graafian follicle).

Estrogen, elaborated by these follicles, acts on the lining of the uterus to produce a proliferative endometrium. The estrogen also acts on the endocervical glands to produce a clear, mucoid secretion which grossly resembles egg-white. Just prior to ovulation, the cervix, uterus, and fallopian tubes are filled with clear, mucoid secretion. Spermatozoa deposited at the upper end of the vagina at this time find easy access through cervical mucus into the uterus and up into the tubes. This clear passage enables fertilization to occur in the ampulla of the tube. Estrogen produced by the ovarian follicles acts on the anterior lobe of the pituitary gland to release luteinizing hormone (LH). LH then stimulates rupture of the graafian follicle with release of the ovum.

Ovulation in the living albino rat has been described and beautifully photographed by Richard J. Blandau. Ovulation was induced in immature rats by giving gonadotropin. In his work, the first indication of approaching ovulation was the formation of the macula pellucida, or stigma, which usually appeared at the apex of the follicle. This stigma forms within a few seconds to several minutes. As rupture of the follicle becomes imminent, the superficial germinal epithelial cells, which cover the stigma, may be observed breaking up into small clumps. The time required to extrude the egg varied according to the position of the cumulus oophorus within the follicle. All ovulations that could be seen in a particular ovary were completed in less than an hour and a half. Often, several follicles ruptured at the same time. Hemorrhage was minimal in most ovulations. In Blandau's magnificent film, he showed how readily the fimbria of the tube seemed to swallow these ova, which were colored by means of a vital dye.

From the Division of Obstetrics and Gynecology and the Department for Research in Human Reproduction, Michael Reese Hospital.

Read before the Population Association of America, Chicago, May 4, 1958.

Ovulation in the human has been observed by but a few men. Decker,[3] who invented the culdoscope or transvaginal peritoneoscope, described ovulation occurring as follows: the fimbria of the tube would apply itself to the follicle and would remain attached for several minutes until the egg was extruded from the follicle into the tube. When the fimbria of the tube fell off the ovary, the ovary became transformed and contained a corpus hemorrhagicum.

Doyle,[4] by means of a different technique, that of culdotomy (using a different type of instrument through a much larger opening in the vagina and with the patient under prolonged general anesthesia), has described and photographed ovulation occurring without the exact attachment of the fimbria of the tube to the ovary.

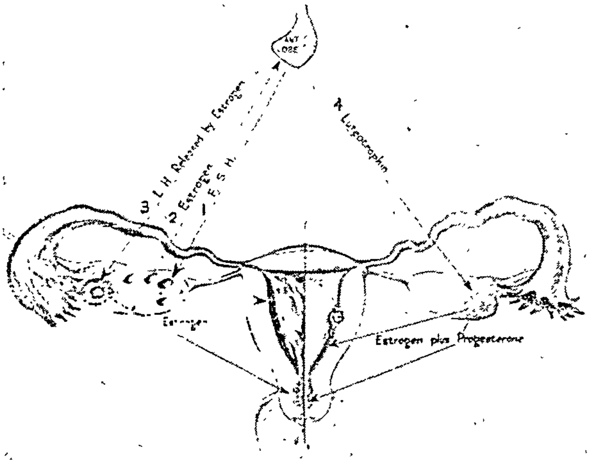


Fig. 1.—Physiology of reproduction.

During one isolated instance at culdoscopy, I observed ovulation occurring as follows: the fimbria of the tube became attached to the lateral aspect of the ovary and remained there for several minutes. After this, the follicle that had been present prior to the attachment immediately was transformed into a corpus hemorrhagicum. Therefore, I was able to confirm Decker's original findings.

After ovulation and extrusion of the egg into the tube, the anterior lobe of the pituitary gland secretes a third gonadotropic hormone, known as prolactin (Luteotrophin). This maintains the corpus luteum. When seen early after ovulation, this corpus luteum occupies from one-third to one-half of the ovary and is intensely red, with a number of blood vessels coursing into it. The area of rupture may be represented by a small blood clot or coagulum, or it may be represented by a thin membrane. When seen about the 15th to 17th day, it has the appearance of an intensely blood-shot eye, "the eye of the corpus hemorrhagicum."

The corpus luteum secretes both estrogen and progesterone, which then act on the proliferative endometrium, converting it to a secretory endometrium or glycogen-containing membrane, into which the fertilized egg can be implanted. Estrogen and progesterone also act on the cervical mucus to thicken it, so that spermatozoa cannot now penetrate into the uterus easily. Fertilization itself takes place in the ampulla of the tube, and the fertilized egg takes several days for its passage into the uterus.

Apparently, tubal epithelium plays an important part in the early stages of cell division. Landrum B. Shettles has been able to develop follicular eggs in vitro. With a large-gauge needle, he taps a mature follicle to obtain an ovum from the ovary in a patient at laparotomy. The ovum and follicular fluid are discharged into a sterile Petri dish, to which a drop of fresh human semen and some minced fragments of mucosa from the fallopian tube are added. Tubal mucosa is used because of evidence that its fibrinolytic enzyme system is important to denudation of the ovum and its subsequent penetration by the spermatozoon. When incubated, the ovum grows to as much as a 32-cell or Morula stage. When actual implantation takes place in the human, the egg is implanted in the blastocyst stage.

Conception, therefore, depends on (1) fertile spermatozoa, (2) receptive secretions in the female, (3) open fallopian tubes, (4) ovulation, (5) good corpus luteum function, and (6) an adequate endometrial response for good implantation of the fertilized egg.

Diagnostic Survey

The wife usually consults her doctor first. However, it is always preferable for both husband and wife to be interviewed before any diagnostic survey is attempted, in order that full understanding and cooperation are obtained from both. In the initial interview, the physician must gain some insight into the emotional needs of the couple. He must determine whether their marriage is secure. Their desire for a child must not merely be an attempt to patch up an unhappy marriage.

The following points should be covered in the initial interview of the couple: (1) length of marriage, including prior marriage of either partner; (2) infertility—primary, secondary, and duration; (3) birth control—duration; (4) conceptions; (5) abortions; (6) previous diagnostic studies; (7) coital history, including frequency, techniques, difficulties, dyspareunia, and frigidity; (8) menstrual history, including leukorrhea; and (9) general history of each partner, including medical, surgical, and nutritional history in childhood, adolescence, and adulthood. A general physical examination of each partner, with genital examination of the husband and pelvic examination of the wife, and general laboratory examination of both partners should also be done.

Semen Analysis.—The actual survey of the infertile couple usually begins with semen analysis, unless the couple present themselves near ovulation time. In that case, it is more rational to observe the effect of spermatozoa in vivo in the female, rather than obtaining a bottle specimen at such a time. Although, theoretically, it only takes one normal, motile spermatozoon to achieve conception, a highly fertile male will have millions of actively motile spermatozoa present in his ejaculate. A sterile semen specimen contains no spermatozoa (azoospermia); few spermatozoa (oligospermia); or all dead spermatozoa (necrospermia). There are vast variations and degrees of fertility, as shown by semen analysis. Gross characteristics include a volume range of 2 to 8 cc. (average, 3.5 cc.), cloudy and whitish fluid, and minimal viscosity. Many times multiple examinations must be done, as there are variations in sperm count (average normal, 40-60 million per cubic centimeter), motility (60% or more motile, with majority showing good forward progression and 8-24 hours' longevity in vitro), and perhaps even morphology (70% or more normal).

In figure 2, variations in semen quality are presented. Motility, as observed in a fresh thin smear, is more important than actual number of spermatozoa. The stained smear is very useful in evaluating semen quality, but the interpretation of abnormal spermatic morphology requires training and experience. The clumping phenomenon, as illustrated, can also be demonstrated in the fresh smear. Clumping of spermatozoa is frequently seen in the ejaculates of infertile males.

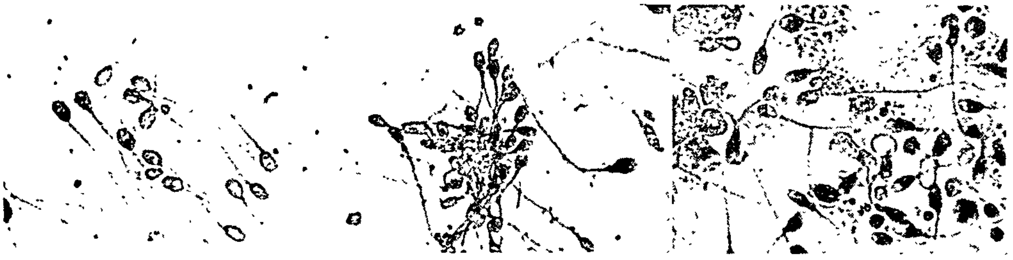


Fig. 2.—Variations in semen quality; *left,* normal spermatozoa; *center,* clumping phenomenon; *right,* highly abnormal sperm population (hematoxylin, rose bengal; × 1,500).

Clinical Evidence of Ovulation.—Pregnancy, of course, is the best evidence of ovulation. Although the ovum is the largest cell in the body, it cannot be found except experimentally by washing out the fallopian tubes. All tests of ovulation are clinical or subjective. They are chiefly the result of the cyclic effects of estrogen and progesterone.

The wife is instructed to take her basal body temperature, rectally if possible, each morning before arising, beginning shortly after her menstrual period is over and continuing daily until menstruation ensues. A typical basal temperature chart is illustrated in figure 3, with the low point of the temperature on the 12th day and a sustained elevated temperature curve from the 14th to 27th day. Should pregnancy result, this elevated temperature will be sustained well beyond the time of the first missed period.

Other associated phenomena are indicated above this basal temperature chart (fig. 3). These include the rat test for ovulation,[5] vaginal smears for evidence of cornification, and quantity and quality of cervical mucus. Below the basal temperature chart, one may note the endometrial biopsy on the last day of the cycle (the first day of the menstrual period), as well as the endometrial biopsy on the 21st day, when glycogen secretion is maximal. The 24-hour daily urine excretion of pregnanediol, a metabolite of progesterone, is also shown.

This typical patient is instructed to report to the office daily from the 10th to 14th day of the cycle. The day of the cycle is counted from the first day of the menstrual period. A vaginal speculum is inserted, without lubrication, and the routine is as follows:

A small amount of vaginal secretion from the vaginal fornix is plated on a glass slide, immediately immersed in equal parts of alcohol and ether according to the method of Papanicolaou, and stained by means of the rapid Schorr stain.

The tip of a glass cannula is inserted into the endocervix, and, by means of gentle suction, a quantity of endocervical mucus is obtained for examination. This is blown out on a glass slide, and an estimation of the amount from 0 to 4+ (profuse) is made. A glass cover slip is then placed on this glob of mucus and the spinnbarkeit or stretch phenomenon measured in centimeters. The cover slip is then replaced, and the slide examined for the presence of white blood cells and spermatozoa. The cover slip is then removed, the mucus allowed to dry, and the fern phenomenon or crystallization of cervical mucus is observed.

Note the variation from the 10th to the 14th day of the cycle (fig. 3). It is believed that ovulation occurs either at the low point in the temperature cycle, the day before this low point, or on the rise from low to high. Prior to ovulation, the cervical mucus becomes profuse, thin, acellular, and stretches from 10 to 15 cm. Normally at this time, large numbers of spermatozoa are recovered postcoitally. The vaginal smear will show gradations of increasing cornification. After ovulation occurs, the temperature becomes elevated and sustained; the cervical mucus becomes scantier and thick and shows very little stretch. The vaginal smear exhibits curling and clumping of cells, or the so-called ex-

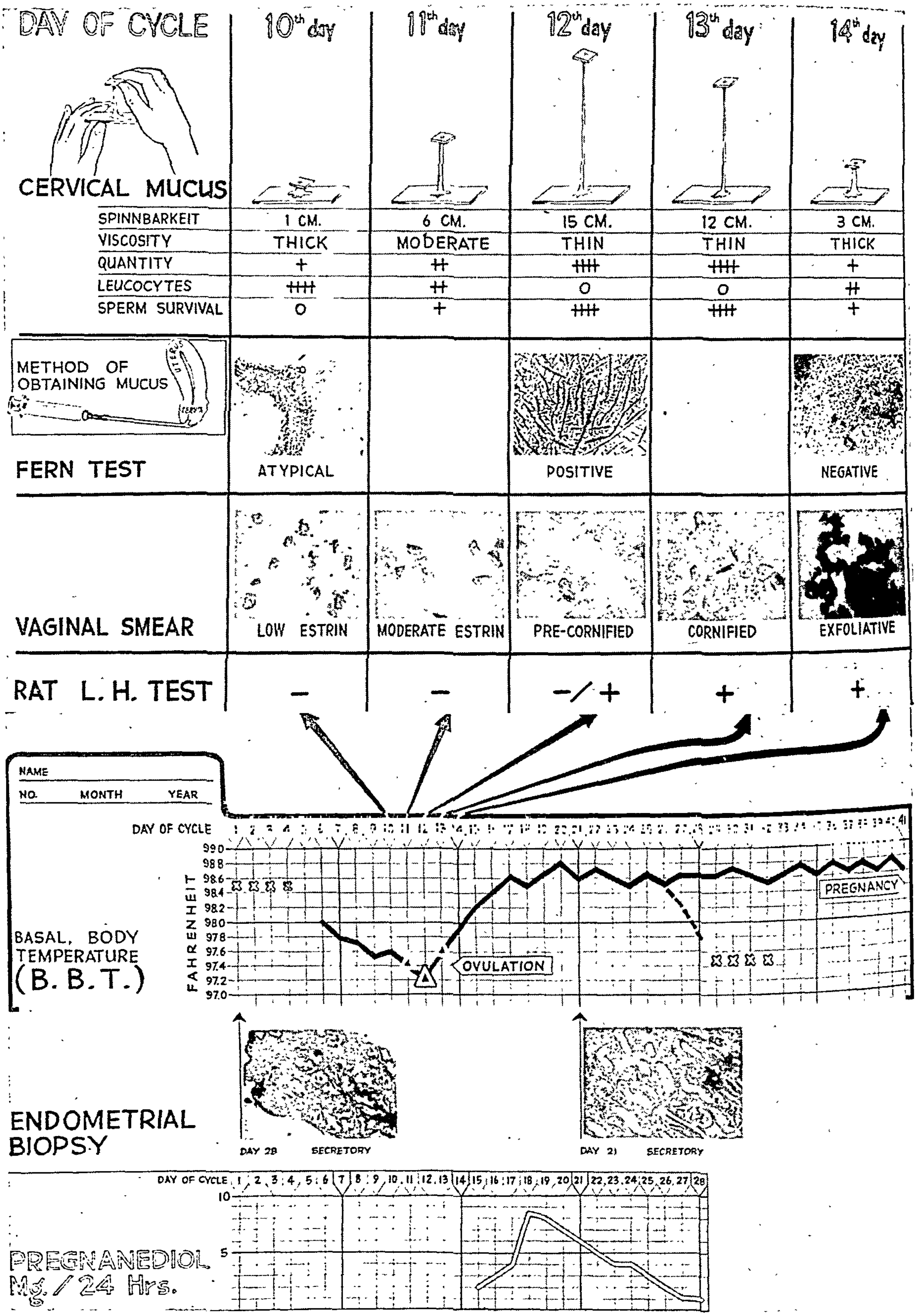


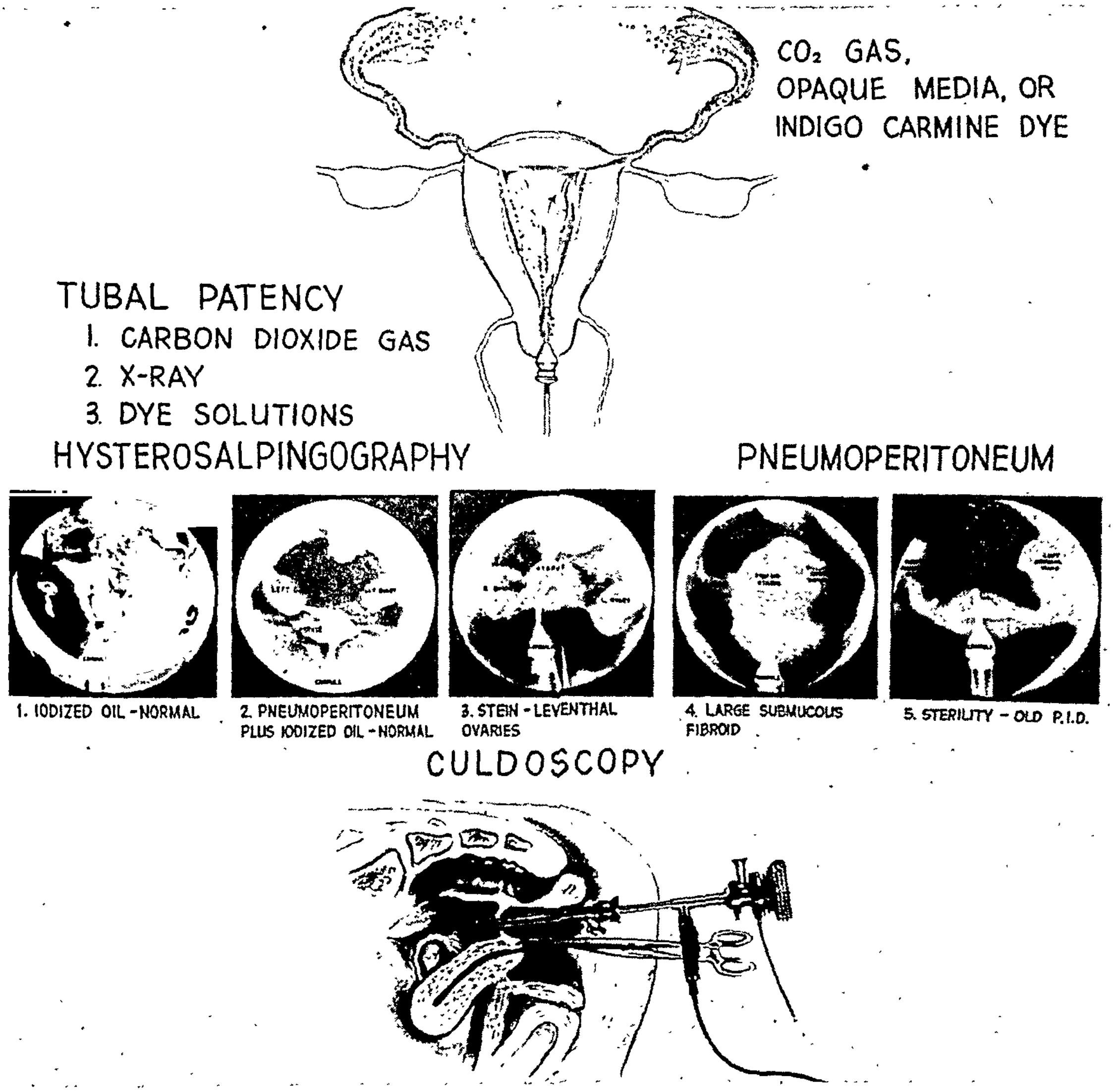
Fig. 3.—Typical charts, with biopsies, showing presumptive evidence of ovulation.

foliative phenomenon. The fern test does not show changes as critical as the vaginal smear, cervical mucus, and basal body temperature graphs.

The rat test for ovulation should prove valuable when the other simpler criteria for ovulation are absent or atypical. The technique of the test is as follows: 3 cc. of the first morning urine is injected intraperitoneally into each of two 50-to-60-Gm. immature female rats, and the rats are sacrificed in four hours; a positive reaction is cherry red hyperemia in one or more of the rats' ovaries. Preliminary experiments in this laboratory indicate that the rat test is positive on the day of maximal spinnbarkeit, as well as on the following day, as indicated on days 13 and 14 in figure 3.

The endometrial biopsy showing secretion in the gland lumina indicates that ovulation probably has taken place but does not indicate the time of ovulation except in retrospect.

Small quantities of pregnanediol may begin to appear in the urine prior to ovulation, but it is chiefly found in the premenstrual phase of the cycle. It must be noted that ovulation can occur with poor corpus luteum function, as indicated by short or atypical diphasic curve on the basal body temperature chart, endometrial biopsy showing poor secretory function, or diminished pregnanediol excretion, resulting in infertility.



1. IODIZED OIL - NORMAL
2. PNEUMOPERITONEUM PLUS IODIZED OIL - NORMAL
3. STEIN - LEVENTHAL OVARIES
4. LARGE SUBMUCOUS FIBROID
5. STERILITY - OLD P.I.D.

Fig. 4.—Tubal patency test, pneumoperitoneum, and culdoscopy.

Tubal Patency Tests (fig. 4).—In 1919, Dr. I. C. Rubin made a revolutionary discovery in the field of infertility when he devised a simple method of establishing whether or not the fallopian tubes are open. The technique is as follows: An intrauterine cannula is inserted through the cervix into the lower part of the uterus. By means of a source of carbon dioxide, and a method of controlling the flow of the gas at low levels, it is possible to establish tubal patency. Typically, the flow of gas rises to a pressure of about 100 mm. Hg and then drops suddenly to a level of 70 or 80 mm. Hg, oscillating at this level. When one listens to the lower part of the abdomen, bubbles of gas are heard to escape from the fimbriae of the tubes. Finally, at the conclusion of the test, when the patient assumes the erect position, the gas so introduced into the peritoneal cavity rises beneath the diaphragm, producing referred pain in one or both shoulders.

An alternate method of establishing tubal patency is performed by utilizing an opaque medium, such as iodized oil or an iodized aqueous medium, which casts a shadow on an x-ray film. This latter method not only is useful in establishing tubal patency but also is useful in delineating the size, shape, and position of the uterus.

Pneumoperitoneum and Culdoscopy.—Refinements in diagnostic techniques involving the female include pneumoperitoneum and culdoscopy. Pneumoperitoneum,[6] is a method of silhouetting the female organs by means of carbon dioxide. This may be combined with opaque mediums, and such a combined procedure has been called complete gynecography. This technique is useful in delineating ovarian cysts, fibroids, and other intrapelvic pathology. The x-rays in figure 4 demonstrate that more information can be obtained by the addition of carbon dioxide gas to the standard hysterosalpingogram. This technique requires special training.

Culdoscopy, or transvaginal peritoneoscopy, introduced by Alfred Decker, has become a valuable addition to diagnostic armamentarium in the survey of the infertile couple. It has made possible demonstration of ovulation or failure of ovulation. This procedure has been invaluable whenever the usual criteria of ovulation were atypical or absent. Culdoscopy is valuable also to establish the presence or absence of peritubal and periovarian adhesions, fibroids, endometriosis, and other barriers to fertility.

In the management of the infertile couple, culdoscopy is usually a final procedure useful in ruling out obscure pelvic pathology. Certainly for those women who have undergone an otherwise exhaustive survey, culdoscopy can be of paramount importance in determining whether they should continue treatment, institute adoption proceedings, or reconcile themselves to a childless marriage. In the older age group, culdoscopy has been used as a means of very rapid survey in order to conserve time. Frequently a final prognosis can be given after this examination. This technique, which requires special training, is illustrated at the bottom of figure 4.

Treatment of the Infertile Man

Treatment of the infertile man has been rather disappointing on the whole. However, general measures for the improvement of health and nutrition should be outlined. The husband should avoid overwork and stress. He should reduce his smoking to a minimum. Good diet and plenty of outdoor exercise are helpful. The gamut of vitamins from A to E have been given. Recently there has arisen an interest in the value of vitamin C to prevent clumping of spermatozoa. Thyroid or the newer triiodothyronine has been given with some benefit.

The normal hypothermia of the testes should be maintained. The patient should be instructed to wear a type of underwear that does not constrict or unduly warm the testicular region. Extremely hot baths should be avoided. The presence of a varicocele may be a factor, and a testicular support or surgical correction may be beneficial.

Testosterone rebound therapy[7] has evoked a great deal of interest. It has long been known that, when testosterone is given to the man, there will be a depression of the sperm count. When testosterone therapy is continued, not only will the sperm count become depressed but a complete azoospermia may be induced. However, when testosterone is then withdrawn, there will be a return to pretreatment levels or even an improvement in the spermatic picture. This so-called rebound phenomenon might show great promise, but it is a dangerous tool and should only be used in the hands of an expert. Testicular biopsies as well as frequent semen analysis are necessary to control such treatment.

Coital frequency and timing is another method of improving fertility. Certainly, if the exact time of ovulation can be ascertained, it would make good sense to instruct the couple to have coitus at that time. Further, if the time of ovulation can be predicted four or five days in advance, it would be advantageous to forbid coitus until the exact time of ovulation. However, the exact time of ovulation is still difficult to detect. Delaying coitus until ovulation had already occurred would be fruitless. Long periods of sexual continence will improve the total sperm count. Frequent coitus, though reducing sperm count, seems to improve the quality and motility of spermatozoa.

Treatment of the Infertile Woman

Treatment in the woman depends on improvement in general hygienic and nutritional factors, as well as correction of abnormal cervical, uterine, tubal, or ovarian factors, as outlined in the diagnostic survey. The diagnostic survey, in itself, is therapeutic, and many women will conceive during this survey. Especially significant is the patient who will conceive after improvement of the cervical factor or after tubal patency tests.

Cervicitis should be treated, if possible, with antibiotics rather than by cautery. Although cautery may cure an infected cervix, cervical glands are destroyed. This destruction of cervical glands diminishes the normal mucorrhea which occurs just prior to ovulation. Hostile or absent cervical secretions are major factors in the infertile woman. This hostile cervical secretion frequently may be improved with small doses of estrogen, such as diethylstilbestrol, 0.1 to 0.3 mg. by mouth daily.

Uterine retroversion, hypoplasia, and fibroids are rarely factors in infertility. Extreme uterine hypoplasia is usually part of an over-all underdevelopment of the female organs and is chiefly secondary to ovarian insufficiency—a condition difficult to improve.

The tubal factor has become less important with better control of gonorrhea and tuberculosis. Tubal obstructions may be treated medically, by means of repeated carbon dioxide patency tests under high pressures, to perhaps blow out the fimbriae of the tubes, as well as by surgical procedures. Surgical results have improved with the advent of finer techniques, antibiotics, and polyethylene tubing used as tubal splints. The over-all results[8] after tuboplasty operations, even those done by the best surgeons, statistically show less than 13% conceptions. Further, there will be an appreciable incidence of tubal pregnancies after such surgical procedures.

The treatment of failure of ovulation depends on adequate diagnosis. When bilateral polycystic ovaries are present, resection of both ovaries has been followed by about 66% good results, with resumption of menstruation, ovulation, and conception. This surgical approach to the so-called Stein-Leventhal syndrome has become a popular method of treatment.

Another popular method of treatment has been low-dosage x-ray therapy to the ovaries and pituitary gland. This method is also followed by approximately the same percentage of results as the surgical approach to the syndrome of bilateral polycystic ovaries. However, geneticists have warned about the danger of increasing the frequency of mutations from gonadal irradiation. Scientists in general have issued warnings against the hazards of using ionizing radiation for benign conditions.

Therapy with estrogens, which normally release luteinizing hormones and theoretically evoke ovulation, has been advocated by many clinicians. Estrogen has been given in very small doses as well as very large doses. Recently, the use of conjugated estrogens (equine), given intravenously,[10] has been advocated. It further has been suggested that, should a patient with amenorrhea and failure of ovulation be refractive to intravenously given estrogen, the physician is then dealing with the Stein-Leventhal syndrome and such a patient should have a bilateral ovarian resection. This logic is confusing to me, and, further, I have not been able to confirm the good results reported with intravenously given estrogen.

The cyclical administration of estrogens and progesterone also has its enthusiasts. The theory behind this type of medication is called "shaking of the clock." Perhaps after menses can be established artificially, the pituitary ovarian cyclical function will become reestablished and ovulation and menstruation will continue. Such treatment, however, is rarely helpful.

Cortisone preparations are useful drugs in the induction of ovulation in patients with adrenogenital syndrome.[11] Such women, with adrenal dysfunction, show elevation of urinary 17-ketosteroid excretion and may show some signs of masculinization, such as moderate to marked hairiness. The present choice of therapy is prednisolone, 30 mg. daily, gradually reduced to a maintenance dose of 10 mg. daily.

In the hypothyroid woman the employment of desiccated thyroid, thyroxine, or triiodothyronine may show spectacular results. These medicaments, unfortunately, are given too frequently to normal individuals without benefit.

The pituitary hormones, such as those extracted from animals or those used in combination with human chorionic gonadotropin, have shown no reliable effects in the human.

Artificial Insemination

The subject of artificial insemination in its entirety is beyond the scope of this paper. Artificial insemination may be divided into homologous or husband insemination and heterologous or donor insemination. Homologous insemination is indicated when there is faulty transmission of spermatozoa from the male to the female, due to impotence or premature ejaculation. Secondly, it is indicated when there is a severe cervical factor precluding sperm migration into the uterus.

Heterologous insemination, where no religious prohibition exists, is indicated in (1) absolute male sterility, (2) severe hereditary defects in the male, and (3) incompatibilities of blood type, both RH and ABO, with sensitization. The results of homologous insemination are poor. On the other hand, the results of heterologous insemination have been excellent.

Fast freezing, storage, and subsequent thawing of mammalian spermatozoa can be performed without impairing the fertilizing capacity. In animal husbandry, frozen semen has been successfully used for some years. Recently an interesting experiment was reported in the use of frozen human semen for insemination, with conception and delivery of normal children.[12]

Gaps in Our Knowledge

A method is needed for diagnosis of a fertile semen sample. Veterinarian colleagues say that the best test of bull semen quality is the percentage of conceptions after artificial insemination in a group of cows. This method of assaying semen quality in the human is untenable. Therefore one must rely on sperm counts, motility, and morphology. Certain standards of semen analysis have been set up, but it is still impossible to delineate absolutely a fertile specimen from an infertile one, unless azoospermia is present. Again, *there is no proof* of fertility except fertility itself. With an extremely poor ejaculate, a poor prognosis is given, but this is frequently in error. Recently I received the following letter:

> Last November and December, my wife and I were patients of yours with regard to our inability to have children during our five and one-half years of marriage. Our family physician . . . had sent us to you for examination and advice. Our last visit with you was around the first of December at which time you stated we had but a slight chance of becoming parents and should look into the possibilities of adopting a child. You suggested we revisit you in about six months for my wife did have some treatments and our case was not utterly hopeless.
>
> I am happy to report that my wife is pregnant, having conceived about the middle of December. I presume you do keep case histories and this may be of some interest and significance in your work.
>
> I should be interested to hear from you if you have any comments or explanations with respect to this, perhaps unexpected, pregnancy.

This is an example of an "unexpected" pregnancy which occurred in the same month that I had given a very poor prognosis. The prognosis was based on an oligospermia with poor motility. This conception occurred after an intensive survey of the couple, which concluded with an iodized oil x-ray examination of the wife.

Treatment of the infertile male needs great improvement. Perhaps part of the answer to this will be in prophylaxis against viruses and the proper management of undescended testes.

Induction of ovulation by means of a potent pituitary hormone is needed. Unfortunately, the human ovary is refractive to animal extracts. To be able to induce ovulation by means of a purified chemical LH principle would solve many problems in the induction as well as the timing of ovulation.

A better test of ovulation timing is also needed. Present tests are tedious and perhaps not too accurate. A new simple test for ovulation,[13] based on the detection of glucose in the cervical secretions, has been described. Should the value of this test be confirmed, it would replace the more complicated tests for ovulation. When patients ask me whether they are ovulating, I tell them that a woman does not ring a bell when she ovulates. Some years ago Burr and co-workers [14] demonstrated a sharp elevation of electrical potential simultaneously with ovulation in the rabbit. Perhaps with better electronic devices now available, this technique could be revived.

Pregnancy wastage in spontaneous abortions is still a great problem. Although a great many vitamin and hormone preparations have been reported to be efficacious, there is still a great need for improved results. Recently the newer progesterone preparations have shown promise. Dr. E. C. Reifenstein Jr. has reported favorable results with a long-acting injectable progesterone in patients who have habitual abortion.

There are still many unknown factors preventing conception. These factors defy even an exhaustive survey of the infertile couple. Many of these factors may be psychogenic. Perhaps many are immunological.

Summary

The age of the wife at the time of marriage has been shown to have a direct bearing on the incidence of sterility. Birth control measures, in themselves, have little effect on infertility, except to place the wife into an older age group having a statistically higher incidence of infertility. The diagnostic survey may appear to be tedious and time consuming. However, adequate treatment without an exhaustive diagnostic regimen is impossible. Fortunately, though difficult to explain, many patients will conceive during or immediately after such a survey.

Perhaps, in the future, the physiologist or chemist will discover a pure pituitary hormone for induction of ovulation, the psychiatrist will be more helpful in reducing stress and anxiety, and the immunologist will discover the remaining factors.

30 N. Michigan Ave. (2).

References

1. Tietze, C.: Statistical Contributions to Study of Human Fertility, Fertil. & Steril. **7:**88-95 (Jan.-Feb.) 1956.

2. Guttmacher, A. F.: Fertility of Man, Fertil. & Steril. **3:**281-289 (July-Aug.) 1952.

3. Decker, A.: Culdoscopic Observations on Tubo-ovarian Mechanism of Ovum Reception, Fertil. & Steril. **2:**253-259 (May-June) 1951.

4. Doyle, J. B.: Exploratory Culdotomy for Observation of Tubo-ovarian Physiology at Ovulation Time, Fertil. & Steril. **2:**475-486 (Nov.-Dec.) 1951.

5. Behrman, S. J.: Personal communication to the author. Farris, E. J.: Test for Determining Time of Ovulation and Conception in Women, Am. J. Obst. & Gynec. **52:**14-27 (July) 1946.

6. Stein, I. F., and Arens, R. A.: Visualization of Pelvic Viscera: Iodized Oil and Pneumoperitoneum Combined in Gynecology, Radiology **15:**85-92 (July) 1930.

7. Heckel, N. J.: Influence of Testosterone-Propionate upon Benign Prostatic Hypertrophy and Spermatogenesis: Clinical and Pathological Study in Human, J. Urol. **43:**286-308 (Feb.) 1940. Heller, C. G., and others: Improvement in Spermatogenesis Following Depression of Human Testis with Testosterone, Fertil. & Steril. **1:**415-422 (Sept.) 1950.

8. Siegler, A. M., and Hellman, L. M.: Tubal Plastic Surgery: Report of Survey, Fertil. & Steril. **7:**170-177 (March-April) 1956.

9. Kaplan, I. I.: Treatment of Amenorrhea and Sterility by X-ray Therapy, New York J. Med. **46:**2746-2752 (Dec. 15) 1946.

10. Kupperman, H. S.; Epstein, J. A.; Blatt, M. H. G.; and Stone, A.: Induction of Ovulation in Human: Therapeutic and Diagnostic Importance, Am. J. Obst. & Gynec. **75:**301-309 (Feb.) 1958.

11. Greenblatt, R. B.: Cortisone in Treatment of Hirsute Woman, Am. J. Obst. & Gynec. **66:**700-710 (Oct.) 1953. Jones, G. E. S.; Howard, J. E.; and Langford, H.: Use of Cortisone in Follicular Phase Disturbances, Fertil. & Steril. **4:**49-62 (Jan.-Feb.) 1953.

12. Bunge, R. G., and Sherman, J. K.: Frozen Human Semen, Fertil. & Steril. **5:**193-194 (March-April) 1954.

13. Birnberg, C. H.; Kurzrok, R.; and Laufer, A.: Simple Test for Determining Ovulation Time, J. A. M. A. **166:**1174-1175 (March 8) 1958. Doyle, J. B.: Cervical Tampon—Synchronous Test for Ovulation: Simultaneous Assay of Glucose from Cervix and Follicular Fluid from Cul-de-Sac and Ovary by Culdotomy, ibid. **167:**1464-1469 (July 19) 1958.

14. Burr, H. S.; Hill, R. T.; and Allen, E.: Detection of Ovulation in Intact Rabbit, Proc. Soc. Exper. Biol. & Med. **93:**109-111 (Oct.) 1935.

HEMORRHAGE AND MASSIVE TRANSFUSION

Alex W. Ulin, M.D., Seymour W. Gollub, M.D., Ph.D., H. Saul Winchell, M.D.
and
Edward W. Ehrlich, M.D., Philadelphia

Studies were made of the blood clotting system of 38 patients who received massive transfusions in connection with cardiac surgery. Of 30 patients who underwent open-heart surgery, 19 received from 3,000 to 11,500 cc. of blood and did not bleed, while 8 received from 4,000 to 21,000 cc. of blood and did bleed. Eight patients who underwent closed-heart surgery, and had hemorrhagic episodes subsequently, received from 3,100 to 15,000 cc. of blood. It appeared that the hemorrhages observed were more probably the occasion rather than the result of the massive transfusions. Eight quantitative laboratory tests were applied to blood samples from these patients, before, during, and after the surgery, but no common cause of bleeding was evident. There was no significant difference between bleeders and nonbleeders with respect to platelet count, fibrinogen concentration, or status of the plasma coagulation system either preoperatively or postoperatively. It would appear that massive transfusion aggravates a tendency for "unexplained bleeding in the surgical patient," but the primary blame for hemorrhage cannot be placed on compatible massive transfusions.

Within the past few years, concomitant with advances in techniques of collection and storage of blood and the daring innovations of modern surgery, there has been described a new syndrome called "hemorrhage due to massive transfusion." This condition is an uncommon complication of surgery, but is particularly associated with large-scale procedures. Its cause is said to be thrombocytopenia by one group,[1] while another group ascribes this syndrome to fibrinolysin[2] and, more recently, multiple clotting defects.[3]

We would like to describe in summary fashion[4] some key findings to date of a study of the blood clotting system of 38 patients who received massive transfusions at Hahnemann Hospital last year, mostly from the department of thoracic surgery, under the direction of Dr. Charles P. Bailey.

Twenty-two patients underwent open-heart surgery and did not bleed (nonbleeders). Eight patients underwent open-heart surgery and did have a hemorrhagic episode (bleeders). Eight patients underwent closed-heart surgery and did have a hemorrhagic episode (bleeders). Excluded from definition of bleeders are those who bled from mechanical causes. No obvious preoperative differences between bleeders and nonbleeders were seen. It is our broad aim to answer three questions about these patients, and these will be considered in order.

Relationship of Bleeding to Transfusion

Is bleeding due to massive transfusion or is massive transfusion given because of hemorrhage?

The volumes of blood given to the patients in 24 hours or less—usually less—were as follows: Nineteen patients underwent open-heart surgery, received an average of 5,400 cc. of blood (extremes, 3,000-11,500 cc.), and did not bleed. Bleeders got a mean total volume of blood that was approximately twice that of nonbleeders. The eight bleeders who were subjected to open-heart surgery received a mean total of 9,500 cc. (extremes, 4,000-21,000), and the eight who underwent closed-heart surgery received 9,000 cc. (extremes, 3,100-15,000 cc.). But, up to the time of bleeding, bleeders in the two groups received about the same total volume as nonbleeders (means, 6,000 and 4,600 cc.; extremes, 4,000-7,750 and 2,000-7,000 cc. respectively).

These data suggest two important concepts: 1. In the patients studied, massive transfusion may have been necessary but was not sufficient in itself to produce hemorrhage. 2. The large volumes of blood given to bleeders were given, in greatest measure if not entirely, because of the hemorrhage, and thus were a result rather than a cause of hemorrhage.

Defect in Plasma or Platelets

Was there a defect in plasma or platelets? To answer this question, we examined the coagulation system. Figure 1 (*left*) gives the platelet values of patients who underwent open-heart surgery. The ordinate is the count of platelets in 1,000 per cubic millimeter. The abscissa shows the times of sampling: initial, preshunt, postshunt, two hours after operation, and 24 hours after operation. The curve at the top shows the results for the total open-heart surgery group. It will be seen that the platelet level fell during the postoperative period and was then maintained. The curve at the bottom shows values of bleeders' platelets and nonbleeders' platelets. It will be noted that there was little difference between them at any given time. This finding is significant, because bleeding was usually manifest during the immediate two-hour postoperative periods.

From the Blood Coagulation Research Laboratory and the Department of Surgery, Hahnemann Medical College and Hospital.

Read before the Section on Pathology and Physiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

Thus, with use of proper controls, i. e., patients who received massive transfusion but did not bleed, we see that thrombocytopenia may have been necessary but was not sufficient to produce hemorrhage. We ascribe the thrombocytopenia to dilution of patient blood with platelet-poor transfusion blood in part. Other data support this concept.

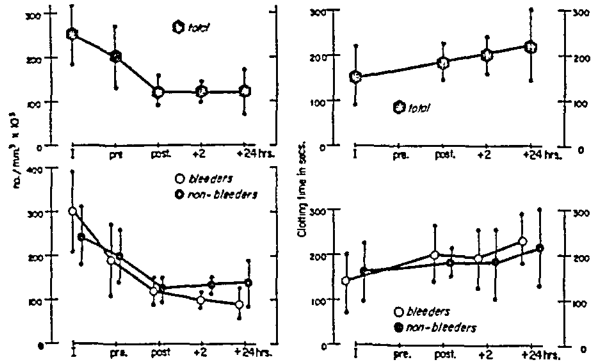


Fig. 1.—*Left,* absolute platelet values and, *right,* absolute recalcified plasma clotting times in patients subjected to open-heart surgery.

The plasma recalcified clotting time of the patients subjected to open-heart surgery (fig. 1, *right*) is a measure of the integrated functioning of the plasma coagulation factors. Examination of the lower two curves shows no difference between bleeders and nonbleeders that is clinically significant.

Figure 2 is concerned with other blood clotting tests. The thromboplastin generation test (*left*) was used to evaluate the early stage. Examination of the lower two curves indicates that there is no significant difference between bleeders and nonbleeders. Similar results were obtained with the prothrombin consumption tests.

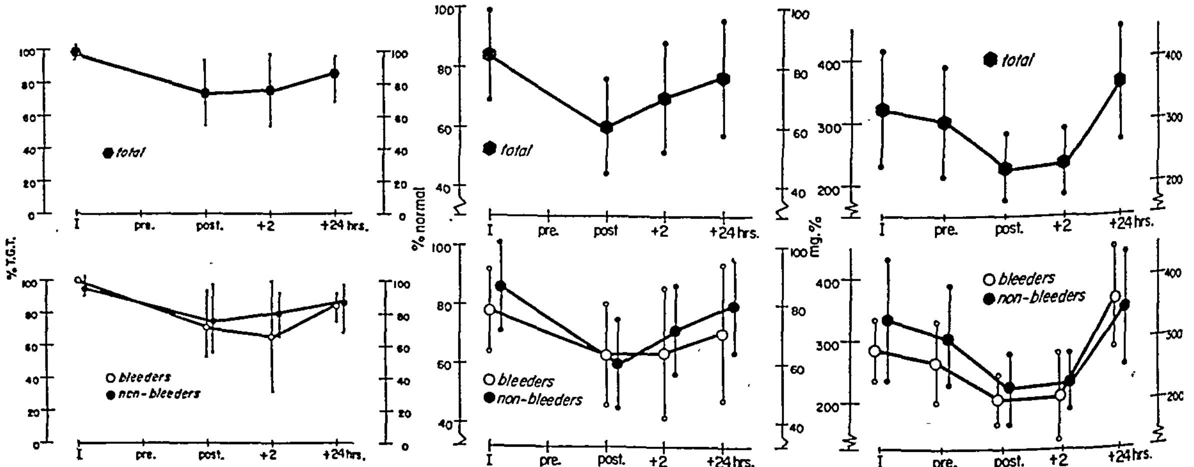


Fig. 2.—Absolute values for, *left,* thromboplastin generation, *center,* one-stage prothrombin level, and, *right,* fibrinogen level in patients subjected to open-heart surgery.

The intermediate stage of blood clotting was evaluated with the prothrombin time determination (fig. 2, *center*). An examination of the bottom two curves shows no significant difference between bleeders and nonbleeders.

The final stage of blood clotting, analyzed on the basis of conversion of fibrinogen to fibrin, is illustrated in figure 2 (*right*). Again, examination of the bottom two curves shows no significant difference between bleeders and nonbleeders. Of interest is the marked 24-hour rise in both groups.

In regard to fibrinolysin in patients who underwent open-heart surgery, only two bleeders had significant fibrinolysin titers. Also, two nonbleeders had significant fibrinolysin titers. Fibrinogen levels correlated well in these four patients. Otherwise, fibrinogenopenia was not in evidence. Fibrinolysin was not impressive. No anticoagulant activity was found in any patients' samples at any time.

Considering next the findings of the blood clotting studies of bleeding patients in the closed-heart surgery group, we may summarize by saying that they were remarkably similar to the data already presented and corresponded test for test with the bleeders in the open-heart surgery group. In addition, there was no correlation between volumes of blood administered and depression of clotting factors or platelet levels. Positive fibrinolysin titer was present in the sample of one patient in the closed-heart surgery group.

Thus, considering the average values of groups of patients, we may conclude that there was (1) no difference between bleeders and nonbleeders' platelet values, (2) no difference between bleeders and nonbleeders' plasma coagulation system, and (3) no fibrinogenopenia, with fibrinolysin not impressive.

Common Cause of Bleeding

Is there a cause of bleeding which is common to the bleeders? To answer this, we will examine the individual cases of bleeders subjected to open-heart surgery and interpret each one as an isolated case of bleeding. We find that the outstanding defects were as follows: thrombocytopenia, 2 patients; acute depression of thromboplastin generation, 1; acute hypoprothrombinemia, 1; significant fibrinolysin titer, 2; findings consistent with a process of intravascular coagulation, 1; and problematical, 1. Therefore, no common cause of bleeding is evident.

Summary and Conclusions

Data on 38 patients receiving massive transfusion, including 16 "bleeders," show that massive transfusion was not sufficient in itself to produce hemorrhage. Massive transfusion may be, and probably in large part was, a result rather than a cause of bleeding. A common cause for bleeding was not evident for all cases. Thrombocytopenia was not sufficient to produce hemorrhage. Fibrinogenopenia and/or fibrinolysin was not impressive. The vasculature is as yet uninvestigated.

Consequently, we cannot place the blame for hemorrhage on compatible blood transfusions. Transfusions may initiate or aggravate the bleeding due to a defective mechanism or a system already primed for hemorrhage. Therefore, every patient to undergo surgery, regardless of magnitude and type of operation, who seems to show a likelihood of requiring transfusions should have a complete investigation of coagulation factors. This would detect a possible defect that could become clinically significant. In this way, specific therapy with the proper blood fraction or factor could be instituted.

230 N. Broad St. (2) (Dr. Ulin).

This study was supported by a U. S. Army Research Contract D.A.-49-007-MD-720.

References

1. Krevans, J. R., and Jackson, D. D.: Hemorrhagic Disorder Following Massive Whole Blood Transfusions, J. A. M. A. **159**:171-177 (Sept. 17) 1955.

2. Cliffton, E. E.; Grossi, C.; and Siegel, M.: Hemorrhage During and After Operation Secondary to Changes in Clotting Mechanism: Physiology and Methods of Control, Surgery **40**:37-53 (July) 1956.

3. Zucker, M. B., and others: Generalized Excessive Oozing in Patients Undergoing Major Surgery and Receiving Multiple Blood Transfusions, J. Lab. & Clin. Med. **50**:849-861 (Dec.) 1957.

4. Gollub, S., in Conference on Extra-Corporeal Circulation, Washington, D. C., National Academy of Sciences, to be published.

ACUTE INTERMITTENT PORPHYRIA WITH RESPIRATORY PARALYSIS

Stanley G. Doll, M.D., Downey, Calif., Albert G. Bower, M.D.
and
John E. Affeldt, M.D., Los Angeles

Porphyria is characterized by remissions and exacerbations; it causes death by producing respiratory failure. Three patients with respiratory involvement during recurring episodes of intermittent porphyria were treated by tracheotomy and mechanical respiratory assistance. The cases serve to emphasize that such patients may recover from their respiratory complication and be ambulant, even after a prolonged illness and in spite of continued excretion of porphobilinogen. Use of the respirator is emphasized, because it will prevent death due to paralytic respiratory failure, thus allowing time for clinical remission and recovery.

Acute intermittent porphyria occasionally may be responsible for respiratory failure and death.[1] Neurological complications of acute porphyria were described as early as 1890,[2] and more cases were soon added.[3] Denny-Brown and Sciarra [1a] stated that the bulbar manifestations in a severe attack of acute porphyria are the usual cause of death. One of their patients was kept in a respirator and died during the second attack two years later. Melkerson and other workers [4] have reported cases of patients recovering from bulbar paralysis. Hoagland [1b] found that once neurological change occurs the mortality is about 75%, death being due to bulbar involvement with respiratory paralysis. He also stated that such patients relapse and few survive more than five years after the initial attack. Markovitz [5] reviewed 64 cases from 1941 to 1953 and added five of his own. His review revealed that when the central nervous system was involved, especially the cranial nerves, the mortality ranged from 60 to 90%. Therefore, cranial nerve involvement indicates a bad prognosis: of 69 patients, 35 had cranial nerve involvement and 22 died. Vocal changes occurred in 26 patients. The patient in one of the five new cases he reported died in respiratory failure. Use of the mechanical respirator was not mentioned.

From the Communicable Disease Service, Los Angeles County Hospital; the Respiratory and Rehabilitation Center for Poliomyelitis, Rancho Los Amigos Hospital, Downey, Calif.; and the Department of Internal Medicine, College of Medical Evangelists, Los Angeles.

Acute intermittent porphyria is characterized by exacerbations and remissions. Consequently, it is conceivable that, if a patient can be tided over the period of respiratory failure by supportive means, such as a mechanical respirator, he might return eventually to a relatively normal existence. We would like to report on three patients who had respiratory failure, who required a respirator, and who later became free from respirator care. Though such patients are subject to subsequent attacks, this report shows they may not produce bulbar or respiratory manifestations.

Report of Cases

Case 1.—A 27-year-old woman was admitted first to an outlying hospital on April 15, 1956, because of red urine. Except for dizzy spells, weakness, and backache occurring intermittently since childbirth in 1954, she had been well. On April 13, 1956, she had a sudden onset of severe back pain associated with generalized weakness and anorexia. Red urine was then seen. Numerous studies were made, but she was discharged seven days later, being told that it was "all in her mind." She was admitted next to a sanitarium and kept overnight, being told that, although she had a nervous condition, she also was physically ill. Then she saw a chiropractor. She became weaker and anorexic, losing 11 lb. (5 kg.) in three weeks. She had difficulty in swallowing liquids. She had abdominal cramps and vague leg and chest pains. She lost the use of her arms and legs. She was referred to the White Memorial Hospital, Los Angeles, on May 2, 1956, with the diagnosis of possible adrenal cortical hypofunction (Addison's disease) or uremia.

The patient's history revealed that she had had constipation most of her life, and this had become more severe since her present illness. She previously had had "dark urine," but the duration or beginning was not recorded. She had grand mal convulsions as a child. One sister also had this, as well as a "nervous breakdown" at the age of 21. Her parents and eight siblings are all living and well. There was no family history of porphyria.

On physical examination on May 3, the patient had an anxious look and was distraught. She spoke in a barely audible whisper. The temperature was 101.8 F (38.7 C) rectally, respiration rate 28 per minute, and pulse rate 134 per minute. Blood pressure was 150/100 mm. Hg. She had many freckles but no unusual pigmentation. Her pupils were widely dilated, and there was a slight downward deviation of the left eye. The gag reflex was normal, but swallowing was impaired. No tenderness, rigidity, enlarged viscera, or mass was noted in the abdomen. There was total flaccid paralysis of all extremities. Sensory function was intact. The deep tendon reflexes were absent except for the ankle reflexes, which were 2+ bilaterally.

Laboratory studies were done on May 4. The hemoglobin level was 13 Gm. per 100 cc. The white blood cell count, hematocrit value, and serum potassium level were normal. Total porphyrin level in the urine was increased, and findings on the test for porphobilinogen were strongly positive. The urine turned dark on exposure to the sun. The fasting blood sugar level was normal. The urine was cloudy and amber-colored, with a specific gravity of 1.016; there were 5 to 10 red blood cells and 8 to 10 pus cells per high-power field. Findings on the Venereal Disease Research Laboratory and Kolmer-Wassermann tests were negative.

Soon after admission, an intern gave 250 mg. of amobarbital (Amytal) sodium intravenously in an attempt to slow the pulse rate; this was without effect. The diagnosis of acute intermittent porphyria was subsequently made, and further use of barbiturates was banned. On May 5, a consulting neurologist confirmed the diagnosis of neuronitis with porphyria. He advised intravenous administration of procaine, 1 Gm. per liter of 5% glucose solution daily, and 10 mg. of prednisolone every four hours by Levin tube; both recommendations were followed. He noted a definite neuropathy of the facial nerve (Bell's palsy) on May 6. At that time, the patient could not wrinkle the forehead, close her eyes, or purse her lips. Tetracycline (Achromycin) was given because of a urinary tract infection in doses of 250 mg. four times daily. By May 7, the patient was unable to swallow and tube feedings were started.

On May 8, the patient was in respiratory distress and she was transferred to the Communicable Disease Unit of the Los Angeles County Hospital for respirator care. The alveolar carbon dioxide tension was 55 mm. Hg (normal 40), giving evidence of hypoventilation.

She was emaciated, disoriented, and acutely ill. She had scanning speech and pooled secretions in her throat. Respiratory excursions were poor. The muscles were described to be of a "doughy" consistency. She had generalized muscle fibrillations with paresis of all four extremities. A chest roentgenogram taken on May 8 showed normal findings.

Total urine porphyrin and urine porphobilinogen levels were highly elevated. An electroencephalogram taken on May 17 showed a normal tracing.

On the day of admission to the Communicable Disease Unit, a high tracheotomy was done and the patient placed in a respirator. Tetracycline therapy was continued and intravenous administration of vitamins was started. Three days later, the patient was rational and had no difficulty in swallowing, but she became irrational periodically. The temperature returned to normal, and less fibrillatory movement was noted in the muscles. Within seven days the patient was allowed short periods out of the respirator. On June 4, her vital capacity was 1,800 cc. (62% of her predicted normal).

On June 7, 1956, the patient was transferred to the Rancho Los Amigos Hospital Respiratory Center. The tracheotomy tube was still in place. She had bilateral upper extremity weakness. The lower extremities showed good function throughout, with the exception of poor quadriceps. The breathing pattern was predominately intercostal, and she tended to use neck accessories during quiet breathing. Obvious disturbance of laryngeal function was demonstrated by speech and cough. By June 12, she tolerated being out of the respirator for one and one-half hours twice a day; her time out was increased about one-half hour per day, with complete freedom by July 12, 1956. Findings on tests for urine porphyrins (including porphobilinogen) were still strongly positive. Findings on the tests for urine porphobilinogen became negative first on July 16, about three months after the acute episode began. At the height of her illness, she weighed about 60 lb. (27.2 kg.). By Aug. 16, the patient was able to get in and out of bed alone and go to the bathroom with minimal help.

She had been started on a program of muscle reeducation and strengthening to all four extremities after admission to Rancho Los Amigos Hospital. Diaphragm reeducation and coughing exercises were given. The patient was discharged Aug. 17, 1956, at her request, to return to the eastern part of the United States.

No further contact was had with her until Jan. 6, 1957, when she was readmitted to the Los Angeles County Hospital with abdominal pain of one week's duration. Prior to this readmission, she had been hospitalized elsewhere and given medicaments, including barbiturates, by hypodermic every four hours for pain. No complaints referable to the muscles were made on admission, and she weighed 80 lb. (36.3 kg.). On physical examination her blood pressure was 130/90 mm. Hg, pulse rate 120 per minute, and respiration rate 20 per minute. She was alert and cooperative. Her deep tendon reflexes were 3+. Sensory functions were intact. The 24-hour urine examination showed positive findings for porphyrins and porphobilinogen. The hemoglobin level and red and white blood cell counts were normal. The patient was given 50 mg. of chlorpromazine (Thorazine) hydrochloride intramuscularly and thereafter 50 mg. every four hours by mouth. On Jan. 10, the knee and ankle reflexes were absent and the patient was emotionally labile, but she had no trouble breathing. Subjectively and objectively she improved rapidly, and she was discharged on Jan. 17, 1957. No additional follow-up data are available.

Case 2.—A 61-year-old man was referred to the Communicable Disease Unit of the Los Angeles County Hospital on June 19, 1956, from another hospital, with the diagnosis of acute porphyria with an ascending type of lower motor neuron paralysis and severe respiratory distress. He had developed abdominal pain on Feb. 11, 1956, which was thought to be a recurrence of ureteral colic, which he had had seven years previously.

The onset of paralytic symptoms began about June 9. He gradually developed paralysis of the lower and then the upper extremities. His voice dropped to a hoarse whisper. On the day of admission, he was dyspneic.

His history was not detailed, except that he had had an appendectomy. System review was negative. His family history revealed that a niece had died with porphyria in 1955 at the age of 27 years.

The patient was described as an acutely dyspneic, perspiring man lying in a "frog-like" position with flaccid extremities. He talked in a whisper, appeared quite anxious, and stated that he was tired. Blood pressure was 140/100 mm. Hg, pulse rate 90 per minute, and respirations 32 per minute and shallow. Temperature was 99 F (37.2 C) rectally. A healing vesicular exanthem was noted over the anterior chest and inner angle of the eyebrows. The lower part of the abdomen was flaccid, and bilateral upper and lower extremity paralysis with muscle atrophy was present. Sensory modalities were intact. Reflexes were absent in the lower extremities, with the exception of a normal plantar response. Weak biceps reflexes were present. The gag reflex was intact. Swallowing was normal, and there was no hypopharyngeal pooling of secretions.

Laboratory studies showed the hemoglobin level and white blood cell count to be normal. The urine was not dark; it contained a trace of albumin and many red blood cells per high-power field. A chest roentgenogram showed both sides of the diaphragm to be elevated with a plate-like atelectasis present at the right base. Results of the test for urine porphobilinogen and uroporphyrin were strongly positive, and the urinary coproporphyrins level was slightly elevated. An electromyogram of muscle groups of the upper extremities, chest, abdomen, thighs, and legs was done July 19, 1956. This showed a lower motor neuron disease of diffuse nature.

At the time of admission to the Communicable Disease Unit, his vital capacity was 800 cc. (23% of predicted normal) and the tidal volume 100 to 150 cc. The patient was placed in a Drinker respirator. He was slightly disoriented. A retention catheter was used until July 3. Procaine penicillin G in aqueous suspension (Crysticillin), dimenhydrinate (Dramamine), and aspirin were given. The patient had been placed on sulfisoxazole (Gantrisin) therapy for mild urinary tract infection.

On July 5, when transferred to the Rancho Los Amigos Hospital Respiratory Center, the patient had no difficulty in chewing, swallowing, or urinating. Speech was hoarse and ability to cough very poor. The breathing pattern was that of the chest and accessory muscles without demonstrable diaphragmatic function. There was no facial or neck muscular weakness, but the abdominal and extremity muscles were all weak.

By July 16, some soft-palate weakness, with the uvula deviating to the left, was noted. A month after admission, the patient became paranoid and disorientated. He developed severe atelectasis, and, on Nov. 2, an emergency tracheotomy was performed. There was slow but gradual recovery, punctuated by recurrent bouts of atelectasis, complaining behavior, and abdominal pains with occasional vomiting. Urine porphobilinogen remained present throughout his hospital stay, with the last urine porphobilinogen level recorded on May 23, 1957. In spite of the continuous excretion of porphobilinogen, there was gradual improvement. By Feb. 28, 1957, he had begun to stand and walk without the aid of respirator equipment; the vital capacity was 2,025 cc., diaphragmatic function was normal, and function of the upper extremities was rated as good. By April 3, no respirator assistance was required. A course of dimercaprol (BAL) therapy was started on May 20 and continued for five days without improvement in muscle power. On June 15, 1957, he was discharged, and 24 days later he stopped using a wheel chair. He has not required respirator assistance since (follow-up until March 28, 1958).

Case 3.—A 6-year-old girl was admitted to the Communicable Disease Unit on Feb. 24, 1956. She had been well until 17 days before admission, when she complained of abdominal pain and malaise. She vomited once but had no fever. During the day of onset, the pain was intermittent; it became progressively worse, and she was operated on for appendicitis in an osteopathic hospital. The discharge diagnoses there included "acute obstructive appendicitis," "postappendectomy paralytic ileus," "malnutrition," and "subacute glomerular nephritis." She had dark urine. On about Feb. 20, 1956, the patient developed weakness of the extremities and respiratory distress with inability to cough. She was transferred to the Communicable Disease Unit, where respiratory equipment was available.

Further history revealed that the maternal great grandfather and the patient's mother both had had porphyria. The mother's first attack was 10 years previous, with dark red urine present and pain in the abdomen and legs.

Physical examination showed the temperature to be 100.6 F (38 C) and the pulse rate 160 per minute. She was anxious; breathing was labored and paradoxical, with the intercostals predominately used. The gag reflex was hypoactive and there was some pooling of secretions in the throat, but she still could swallow. The ability to cough was very poor. There was marked generalized weakness. Sensory functions were intact, although both the superficial and deep tendon reflexes were absent. Plantar response was normal.

Laboratory studies revealed a hemoglobin level of 11.4 Gm. per 100 cc., red and white blood cell counts normal, blood urea nitrogen level 23.5 mg. per 100 ml., and serum potassium level 3.1 mEq. per liter. The 24-hour urine creatinin level was 2,058 mg. Results of tests for urine porphyrins (total and porphobilinogen) remained positive, the last time tested being June 8, 1956. Examination of the spinal fluid was normal. A chest roentgenogram showed suggestion of right apical atelectasis. Microscopic slides of the appendix were obtained and studied, and no pathosis was noted.

The patient was subjected to tracheotomy and placed in a respirator on the day of admission. Three days later, chest fluoroscopy revealed that there was a paradoxical motion of the diaphragm. She was started on tetracycline therapy for respiratory infection. She was kept on therapy with 250 mg. of thiamine given twice daily for nearly two months. By June 1, she was out of the respirator 12 hours on her own and by June 4 was in her own bed during the entire 24 hours.

She was transferred to the Rancho Los Amigos Hospital Respiratory Center on June 7, 1956. Examination revealed that she had a strong diaphragm. Her vital capacity was 50% of normal. By July 17, she was so improved she used a free gait for two hours per day instead of the walker. One month later (Aug. 13, 1956) the patient was discharged with bilateral short leg braces.

The patient was again admitted to the Communicable Disease Unit on Oct. 6, 1956, for severe abdominal pain. Intermittently, she had had dark urine since June 7. Moderate bilateral atrophy of both legs and thighs was present. The urine was dark red-brown. Aspirin, chlorpromazine, and codeine were given. She had a fluctuating temperature to 104 F (40 C), but improvement was rapid and she was discharged Oct. 16, 1956. Leg braces were removed on Nov. 8, but she fell occasionally. Both her and her mother's urines were positive for porphobilinogen.

The patient was readmitted to the Communicable Disease Unit on Feb. 20, 1957, for stomach pains of five days' duration, constipation for three days, and leg pains for one day. At this time, her mother stated that the child's urine had been dark red-pink since her first attack in February, 1956, even when she was fairly well, but had become redder during the present attack. She was given chlorpromazine, 10 mg. four times per day. She was discharged improved three days later.

She was readmitted to the same unit on June 17, 1957, and discharged improved two days later, still on chlorpromazine therapy. The intermittent pains in the legs, abdomen, and chest were insufficient to require prolonged hospitalization. The patient has not been seen since.

Comment

Three cases have been described with respiratory involvement during recurring episodes of intermittent porphyria. These patients' treatment included tracheotomy and mechanical respiratory assistance.

All three patients developed respiratory failure due to paralysis of the respiratory muscles. They also accumulated secretions in the airway due to bulbar paralysis or inadequate cough. Either respiratory paralysis or obstructed airway, or the combination, as observed in these patients, will produce death in a very short time. Death due to respiratory failure can be prevented by mechanical medical assistance.[6] Tracheotomy will bypass the obstructive material in the hypopharynx and permit adequate and frequent suctioning of the lower airway, and a mechanical respirator will provide adequate ventilation for as long as necessary.

Porphyria is characterized by remissions and exacerbations; it causes death by producing respiratory failure. If respiratory function is maintained mechanically, time may bring about a remission. Although repeated exacerbations of the disease may be fatal, these cases indicate what sort of recovery is to be expected during the year after the acute onset. These serve to emphasize that such patients may recover from their respiratory complication and be ambulant, even after a prolonged illness and in spite of continued excretion of porphobilinogen.

Chlorpromazine was not put specifically to a clinical test for evaluation of the results. Universal recognition and medical diagnosis of this disease is still lacking, and needless surgery and drug administration is still noted. These have aggravated the underlying condition in most new cases that have been described. Inasmuch as the condition is inherited, a good history may suggest the diagnosis even before the urine porphobilinogen test is done. Until the disease is better understood and control measures are available, supportive treatment is indicated in the attempt to attain a prolonged remission. At present, there is more information on what not to give the patient in the way of treatment than there is on what to give. Chlorpromazine currently is being tried, but, though frequently helpful, it is not the therapeutic answer. The respirator is a useful tool to tide over patients with respiratory paralysis and, if used, can forestall, at least temporarily, what otherwise is certain death.

Summary

Three case reports have been given of acute intermittent porphyria in which respiratory failure developed. Treatment included use of the respirator until respiratory muscle function returned during the period of remission. Use of the respirator is emphasized, because it will prevent death due to paralytic respiratory failure, thus allowing time for clinical remission and recovery.

One patient was noted to improve clinically in spite of continuing positive urinary porphobilinogen findings; the other two improved as the urinary prophobilinogen excretion decreased.

13001 Paramount Blvd. (Dr. Doll).

This study was supported, in part, by a grant from the National Foundation for Infantile Paralysis, Inc.

References

1. (*a*) Denny-Brown, D., and Sciarra, D.: Changes in Nervous System in Acute Porphyria, Brain **68:**1-16 (March) 1945. (*b*) Hart, F. D., and Collard, P.: Acute Idiopathic Porphyria Presenting as Progressive Paresis of Landry Type Brit. M. J. **1:**278-279 (Feb. 4) 1950. (c) Roth, N.: Neuropsychiatric Aspects of Porphyria, Psychosom. Med. **7:**291-301 (Sept.) 1945. (*d*) Nesbitt, S.: Acute Porphyria J. A. M. A. **124:**286-294 (Jan. 29) 1944. (*e*) Nesbitt, S. and Watkins, C. H.: Acute Porphyria, Am. J. M. Sc **203:**74-83 (Jan.) 1942. (*f*) Palmer, H. W.: Case of Acute Idiopathic Hematoporphyria with Acute Ascending Paralysis, Ann. Int. Med. **13:**1500-1508 (Feb.) 1940. (*g*) Hoagland, P. I.: Acute Porphyria: Report of Two Cases with Neurologic Manifestations, Proc. Staff Meet. Mayo Clin. **17:**273-280 (May 6) 1942. (*h*) Waldenstrom, J.: Porphyrias as Inborn Errors of Metabolism, Am. J. Med. **22:**758-77 (May) 1957. (*i*) Gibson, J. B., and Goldberg, A.: Neuropathology of Acute Porphyria, J. Path. & Bact. **71:**495-50 (April) 1956

2. Ranking, J. E., and Pardington, G. L.: Two Cases of Haemato-Porphyrin in Urine, Lancet **2:**607-609 (Sept. 20) 1890.

3. Günther, H.: Die Hämatoporphyrie, Deutsches Arch. f. klin. Med. **105:**89-146 (Dec.) 1911.

4. Melkerson, E.: Un cas de porphyrie aiguë spontanée avec symptômes nerveus et un brève revue de la question des porphyries, Acta. med. scandinav. **63:**153-173, 1926. Baker, A. B., and Watson, C. J.: Central Nervous System in Porphyria, J. Neuropath. & Exper. Neurol. **4:**68-76 (Jan.) 1945. Garcin, R.: Manifestations nerveuses des porphyries, Canad. M. A. J. **75:**973-980 (Dec. 15) 1956.

5. Markovitz, M.: Acute Intermittent Porphyria: Report of Five Cases and Review of Literature, Ann. Int. Med. **41:**1170-1188 (Dec.) 1954.

6. Affeldt, J. E.; Collier, C. R.; and Hackney, J. D.: Mechanical Treatment of Pulmonary Failure, Postgrad. Med. **19:**550-558 (June) 1956.

BALANCED ANALGESIA FOR THE POOR-RISK PATIENT UNDERGOING THORACIC SURGERY

Crisostomo C. Santos, M.D.
and
Robert B. Sweet, M.D., Ann Arbor, Mich.

The term "balanced analgesia" implies the production of anesthesia with use of several agents, often administered by different routes, which are detoxified and excreted in several different ways. In brief, it is simply balanced anesthesia minus true hypnosis. In dealing with a poor-risk patient the friendly and informal approach to the patient is the most humane. Most of these patients are fully cognizant of their precarious condition before they elect to undergo an operative procedure. It is a well-established clinical thesis that shock or functional impairment of the circulation will often be induced in borderline patients by general anesthesia, particularly during prolonged procedures. There are four merits of a balanced analgesic technique: 1. The anesthetic agent and supplemental drugs used are almost universally acceptable to all patients. 2. There is minimal disturbance of physiologic mechanisms. 3. A relatively wider margin of safety for the patient and optimal working conditions for the surgeons are provided. 4. There is a relatively shorter and uneventful postoperative course.

The rapid growth and progress of surgery on the poor-risk patients for thoracic surgical procedures have served to intensify the problems of the anesthetist. Today we are not simply concerned with just an alive patient after a hazardous operation; we attempt, with a high degree of assurance, not to upset any further the physiological balance present prior to operation. We also consider of equal importance the rapid and uneventful postoperative recovery of the patient, with a short, pleasant, and safe convalescence. With these as primary motives, the use of the analgesic technique was revived and further improved, and it consequently has gained recognition and popularity among several of the teaching centers in anesthesiology.

The value of analgesia was first suggested in 1847 when Snow[1] described it with use of diethyl ether. Snow observed that an analgesic state existed after emergence from deeper degrees of etherization. In 1921, Gwathmey[2] reported on ether analgesia by the oral route for operations of short duration and for dressing wounds during World War I. He claimed that patients under the effects of ether analgesia answered questions, suffered no pain, and had no memory for the entire event. It was not until January, 1955, that this idea was revived and reevaluated by Artusio.[3] He gave a detailed description of the first stage of diethyl ether anesthesia in man and reported his technique for major surgical procedures, particularly heart surgery. Two years later, Schotz and co-workers[4] reported on succinylcholine and inhalation analgesia for major cardiac and pulmonary surgery.

We are reporting another technique along this line, which was developed at the University of Michigan Hospital and used on 100 patients undergoing thoracic surgery and thought to be poor risks. The term "balanced analgesia" was coined and may be said to have evolved from its immediate predecessor, "modern balanced anesthesia."[5] The latter implies the production of anesthesia with use of several agents, often administered by different routes, which are detoxified and excreted in several different ways. Balanced analgesia, in brief, is simply balanced anesthesia minus true hypnosis.

Technique

All patients are seen the evening before surgery. A complete evaluation of the patient's chart is made before the actual interview. This includes a review of his complete history, physical examination, laboratory examination, past and present drug therapy, and previous operative and anesthetic procedures. The conversation with the patient is in a most friendly and informal manner. At this time he is reassured, and rather detailed information of the preanesthetic and anesthetic procedure, including postoperative care, is outlined. However, every precaution is taken not to tell the patient that he will be conscious and questioned during the surgical procedure.

Preoperative medication consists of an adequate oral dose of pentobarbital sodium given the evening before surgery to assure a restful night's sleep for the patient; another dose of the same drug is given two hours before induction of anesthesia. A moderate dose of morphine sulfate, 6-10 mg., and scopolamine, not to exceed 0.3 mg., is administered by the subcutaneous route one hour before induction of anesthesia.

When the patient arrives at the anesthesia induction room, provision for the convenient intravenous administration of drugs is provided by means of a three-way stopcock attached to an 18-gauge needle in an arm vein, preferably in the down side when the patient is in the lateral operative position. Top-

---

From the Department of Anesthesiology, University Hospital and University of Michigan Medical School.

Read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

ical anesthesia of the larynx and tracheobronchial tree is obtained either transtracheally along with simultaneous administration of 100% oxygen or transorally by means of a spray immediately before endotracheal intubation. We believe a 10% solution of cocaine to be the drug of choice. Depending on the level of the initial blood pressure, meperidine hydrochloride in a 1% solution is given intravenously in 10-mg. dosage increments until the patient develops signs of partial analgesia to moderately painful cutaneous stimulation. An interval of ap-oximately two to three minutes is allowed be-veen the dosage increments to allow sufficient ne for the effect of the meperidine to be ob-rved, since most of these poor-risk patients have prolonged circulation time. Additional doses of ieperidine are not given if any significant degree f hypotension develops. If hypotension should occur, ventilation is provided with 100% oxygen and the patient is placed in a modified Trendelenburg's position until the blood pressure returns to the initial level. As soon as the patient's blood pressure becomes stable, with or without partial analgesia, induction is carried out with intravenously given thiamylal sodium in a 2% solution administered intermittently in 20-to-40-mg. doses to the point of mild hypnosis. By mild hypnosis we mean the state in which the patient will barely respond to simple questions. A 40-mg. dose of succinylcholine in a 2% solution is given intravenously to accomplish a fast and atraumatic oral intubation with an appropriate size of Portex endotracheal tube. Ventilation is again provided with 100% oxygen before the endotracheal tube is connected to a semiclosed circle absorption system. From this point on, the respiration is continuously controlled until the chest is completely closed.

We prefer to use either a Forreger or a Heidbrink machine, which has a wide and easily readable form of calibration for both nitrous oxide and oxygen in liters per minute. We then start the administration of a gas mixture with 1½ liters flow of oxygen and 3½ liters flow of nitrous oxide and allow the patient to breathe this mixture for about 15-20 minutes. This time period will permit denitrogenation and allow a sufficient but safe concentration of nitrous oxide to be attained in the patient's system. A continuous slow drip of 0.2% solution of succinylcholine, set at 8 to 10 drops per minute, is begun. This is used to prevent the initiation of possible dangerous reflex cardiac arrhythmias from the operative manipulations inside the chest, but in such minimal doses it is inadequate to produce total neuromuscular block.

The patient is then placed in position for the proposed operative procedure. During the usual sterile preparation and draping, the patient is tested as to the degree of analgesia attained. The concentration of nitrous oxide is then varied between 0 and 67% for maintenance of complete analgesia without true hypnosis. Several doses of meperidine, 1% solution, are administered intermittently to fortify the state of analgesia provided by nitrous oxide. The nitrous oxide and meperidine are continuously titrated to maintain the desired type of analgesia. Prior to surgery an intravenous 16-gauge needle is placed for blood replacement.

When the pleura is incised and after the rib retractor is in place, 10 cc. of a 1% solution of lidocaine is infiltrated into the hilum of the lung on the operative side to eliminate bucking on the endotracheal tube consequent to surgical manipulation and compression of the lung. Electrocardiographic recordings are made throughout the surgical procedure with a Cambridge operating room cardioscope or a direct writer. Blood pressure and pulse rate are also monitored carefully. Adequate measurement of blood loss and replacement is assigned to the operating room circulating nurse under the supervision of the anesthesiologist.

Through the surgical procedure, the patient is questioned intermittently as to his perception of pain and comfort. The patient's ability to think is tested by means of simple commands and questions, and his ability to hear is determined by spoken voice. When there is only partial analgesia, the patient clinches his fingers tightly or grimaces, moves on painful stimulation, and indicates on questioning that pain is present. The control of these undesirable signs and symptoms of inadequate analgesia through the use of relaxants is illogical. Instead, we believe it is more rational to increase the safe concentration of nitrous oxide and/or administer meperidine in order to obtain total analgesia. When there is hypotension concomitant with partial analgesia, we prefer to increase the concentration of nitrous oxide; when partial analgesia is not accompanied by hypotension, it is preferable to give additional increments of meperidine, since it has a less hypnotic effect than nitrous oxide.

Postoperatively, the patients were totally amnesic for the events during the entire operative period, including the state of partial analgesia. In general, the postoperative course was short, uneventful, and relatively free of significant complications. The thoracotomy drainage was usually removed on the second postoperative day and the patient was ambulant on the same day.

Results

The types of operative procedures carried out in this series, with use of this particular analgesic technique, were as follows: mitral valvuloplasty or valvulotomy (77), Beck 1 operation (1), repair of mitral insufficiency (2), pericardiectomy (2), Hufnagel's operation for aortic insufficiency (1), aortic commissurotomy (heart-lung bypass) (2), repair of infundibular pulmonary stenosis (heart-lung bypass) (1), Pott's anastomosis (1), repair of coarctation of aorta (2), ligation of patent ductus arteriosus (1), transthoracic exophagectomy and esophagogastrostomy (3), repair of coarctation of aorta and ligation of patent ductus arteriosus (1), revision of esophagojejunostomy (1), right middle lobectomy

(1), excision of multiple lymphatic mediastinal cysts (1), exploratory thoracotomy and pleural biopsy (1), and second stage thoracoplasty (2).

There were 62 women and 38 men; the ages ranged from 4 to 84 years, with an average of 35.38 years. Weights ranged from 38 to 197 lb. (17.2 to 89.4 kg.), with an average of 121.66 lb. (55 kg.). The physical status of these patients (according to the American Society of Anesthesiologists' classification) was between classes 3 and 4.

In order to present a better evaluation of the statistical analysis of our results, we have divided the cases into two groups: (1) operations done on patients for mitral stenosis and (2) operations done on patients for other than mitral stenosis. The different factors taken into consideration are as follows: (1) adequacy of preoperative sedation, (2) effect of preoperative medication on blood pressure and pulse rate, (3) amount of thiamylal (2%) used, *(4) amount of meperidine (1%) administered,* (5) amount of succinylcholine (0.2%) given, and (6) duration of anesthesia.

Only 6% of the patients in both groups (5 of 77 patients in the mitral group and 1 of 22 in the nonmitral) had inadequate sedation from the preoperative medication. After the administration of the preoperative medication, the average decrease in systolic blood pressure was 10.5 mm. Hg in both groups (in 56 and 17 patients, respectively, with average increases of 8.09 in 16 patients and 13.3 mm. Hg in 3, and no change in 5 and 3 patients). The average increase in pulse rate was 8.08 per minute in the mitral group and 7.2 per minute in the nonmitral group (in 35 and 14 patients, respectively, with average decreases of 12.8 in 36 patients and 9.02 in 9, and no change in 6 and 0). The average total amount of thiamylal (2%) given per patient was 126.6 mg. (range, 40-300 mg.) in the mitral group and 126.8 mg. (range, 40-280 mg.) in patients without mitral stenosis. In regard to succinylcholine (0.2%), the average amount administered to the two groups was 334.3 mg. (range, 80-900 mg.) and 473.2 mg. (range, 80-1,000 mg.) respectively. The average anesthesia time for the mitral group was 158.44 minutes (range, 100-345) and 293.26 minutes (range, 155-470) for the nonmitral group. The average weight of the mitral patients was 120.98 lb. (54.9 kg.) and 123.91 lb. (56.3 kg.) for the patients without mitral disease. The average amount of meperidine administered was 0.51 mg. per kilogram of body weight per hour, and the average amount of succinylcholine given was 1.8 mg. per kilogram of body weight per hour in the mitral group of patients; in the nonmitral group, the average amount of meperidine administered was 0.61 mg. and of succinylcholine, 1.7 mg.

Morbidity.—As expected, our patients did relatively well with this particular type of analgesic technique. Most of them maintained their vital signs within the normal limits. Patients with short periods of marked sinus bradycardia were treated adequately with atropine, 0.3 mg. Also some patients had short periods of moderate hypertension and tachycardia from partial analgesia. They responded satisfactorily to additional increments of meperidine and/or increased safe concentrations of nitrous oxide. Patients with severe episodes of hemorrhage, enough to produce moderate to severe hypotension, responded adequately to blood replacement.

In one patient, a saddle embolus and a cerebral embolization occurred during an intra-auricular manipulation of the mitral valve. This patient failed to regain consciousness immediately at the termination of surgery, and bilateral stellate ganglion blocks were carried out on two occasions postoperatively. At the time of discharge from the hospital, this patient was ambulant but still exhibited signs of residual moderate left-sided hemiple Another patient developed a saddle embolus du to the intracardiac exploration and manipulation. T *embolus was removed surgically immediately after* the mitral procedure, and the patient proceeded to do well postoperatively.

One patient developed a short episode of marked hypertension and paroxysmal auricular tachycardia during the induction of analgesia. This patient had been extremely apprehensive prior to surgery, and, on his arrival in the induction room, it was noted that the preoperative medication effect was inadequate. Consequently, there was need for a dose of thiamylal, meperidine, and nitrous oxide greater than usual to produce and maintain the desired state of analgesia.

Mortality.—The over-all mortality in the series was as follows: Of the five patients in the mitral group who died, three died during the operation from severe, uncontrollable hemorrhage due to the markedly calcific and fragile atrial tissues and one died from ventricular fibrillation during multipl prolonged manipulations of the mitral valve. Autopsy findings in this patient revealed marke coronary arteriosclerosis, recent coronary thrombosis, and myocardial infarction. The last patient di suddenly 18 hours after operation from myocardi failure; an antemortem occluding thrombus, exten ing from the left ventricle into the aorta, was foun at the postmortem examination.

An autopsy on the patient in whom mitral commissurotomy and reconstruction of an anomalous pulmonary venous drainage was performed disclosed chronic rheumatic mitral and aortic valvulitis with severe mitral and moderately severe aortic stenosis. Also, a nonfunctioning left superior pulmonary vein which was previously resected from the left subclavian vein and anastomosed into the left atrium was revealed. This patient finally died during the early postoperative period from severe uncontrollable pulmonary edema, primarily in the left lung.

The other two deaths occurred in patients who had had aortic commissurotomy. Ventricular fibrillation developed during the heart-lung bypass. Autopsy findings in both revealed severe calcific aortic stenosis with marked coronary and myocardial degenerative changes.

The six patients who died during operation were doing well with our particular analgesic technique until the occurrence of the tragic precipitating episodes. All patients who survived the surgery and anesthesia, except the one who developed saddle embolus and cerebral embolism, and including the two who died in the early postoperative period, were completely awake and coherent immediately at the conclusion of surgery. All answered questions coherently and cooperated enough to cough when asked to do so and for hyperventilation to be achieved.

Comment

In the management of any anesthetic procedure, the preparation of the patient must be the first consideration. In our experience, we have found the friendly and informal approach to the patient be the most humane, especially when one is aling with a poor-risk patient. Most of these patients were fully cognizant of their precarious condition before they elected to undergo an operative procedure. We found them, as a group, to be extremely anxious and apprehensive during the first visit. By approaching them with confidence and sympathy and, in addition, providing them with detailed information of the anesthetic care, we relieved most of these patients of their anxiety and fear. Several of them commented that the preoperative visit alone, even before premedication was administered, completely changed their apprehensive attitude toward the approaching operation. On arrival in the operating suite, most of them were sufficiently drowsy to be emotionally calm and yet coherent enough to respond to questioning.

We also noted, much to our surprise, that many of the patients in this series who had previous experience with diethyl ether anesthesia were more concerned with the anesthetic agent to be administered than with the operation itself. The request by the patient to "use any anesthetic agent ther than ether" was frequently heard. This is nother reason why we thought of introducing nother technique which was similarly safe but greeable to most patients in general.

Pentobarbital sodium is used as part of the preoperative medication for its known sedative and somnifacient effects. Ordinary hypnotic doses have no significant untoward effects on the vital functions of the body. Morphine is used for the additive sedation it contributes to pentobarbital, for the euphoria it produces secondary to the relief of worry and anxiety, and for its depressant action on the metabolic rate.

Although we are aware of its depressant action on respiration, we believe that its concomitant depressant effect on the rate of metabolism lessens to some degree its full depressant action on respiration when used in moderate doses. Again, when morphine is used in the dosage range we prescribe for our patients, it has little effect on blood pressure and heart rate or rhythm. The average fall in blood pressure in this series after this type of premedication was 10.5 mm. Hg—which we do not consider as very significant. We ascribed this change in blood pressure as secondary to the sedation and lessened physical activity of the patient.

Some anesthetists believe the additive effects of pentobarbital and morphine on the hemodynamics, even in the doses we used and especially to patients with mitral stenosis, may produce adverse results. However, applying the student's T-test and taking the usual 95% confidence level, we were allowed ranges of systolic blood pressure before administration of premedication of 105.999 to 123.845 mm. Hg for the mitral group and 110.449 to 134.595 mm. Hg for the nonmitral group. Therefore, the mean systolic blood pressures of 106.5 mm. Hg and 122.522 mm. Hg in both groups, respectively, which we obtained after the administration of the preoperative medication are within the allowable ranges, and hence the decreases in the systolic blood pressures are not significant.

Scopolamine is selected in preference to atropine because of its sedative, amnesic, and greater drying effects; it has also less cardiac vagolytic action than atropine. Adequate dryness was present in all patients on arrival to the operating suite, and this was reasonably maintained during the rest of the operative procedure. The average increases in pulse rate from the readings taken in the ward previous to the administration of the belladonna drug were 8.08 per minute in the mitral group and 7.2 per minute in the nonmitral group. These increases are not considered as significant to precipitate undesirable ventricular tachycardia.

Again, according to a few anesthetists, any effective drying dose of a belladonna drug may produce untoward response to cardiac rate and rhythm in the form of ventricular tachycardia which may lead to fatal ventricular fibrillation in patients with mitral stenosis. However, applying again the student's T-test and considering the usual 95% confidence level, we were allowed ranges of pulse rate before administration of scopolamine of 70.790 to 89.834 per minute for the mitral group of patients and 73.515 to 89.615 per minute for the nonmitral group. Therefore, the mean pulse rates of 83.1 and 89 per minute in both groups, respectively, which we obtained after the scopolamine was given are within the allowable ranges, and, hence, the increases in pulse rates are not significant. Not only were these decreases in systolic blood pressure and the increases in pulse rate statistically insignificant but also there were a fair number of cases in which increases in systolic blood pressure and decreases in pulse rate were obtained instead.

Cocaine (10%) is our drug of choice for topical anesthesia of the tracheobronchial tree because of its high potency and longer duration of action. On the other hand, in a relatively greater vascular area, such as the hilum of the lung, we prefer lidocaine (1%) for infiltration because of its greater penetrability and lower potency in case of inadvertent intravascular injection.

Nitrous oxide in safe concentration may be considered as the safest and the most innocuous anesthetic gas in clinical use at the present time. It does not possess any untoward effects to tissues and vital function when used in the absence of anoxia. It is nonirritating, nonexplosive, and, in subanesthetic concentrations, definitely analgesic. The optimal concentration of the gas for analgesia without loss of consciousness is 35 to 40 vol. %.[6] However, because of its relatively low anesthetic potency and when used for major surgical procedures, it usually necessitates supplementation by another analgesic agent. In this case, we prefer to use meperidine in intermittent small doses administered intravenously. Like morphine, meperidine produces euphoria secondary to its analgesic action. Although it also exhibits sedation, like morphine, the ratio of its analgesic to hypnotic potency is greater than that of morphine in equivalent doses. Because of its depressant effect on respiration, it requires manual control of the patient's ventilation. With our method of administration of meperidine in these patients, we have noted no significant untoward effects on the cardiovascular system. Mild atropine-like action on the secretory glands of the tracheobronchial tree, on the heart, and on the bronchial musculature are other minor advantages of meperidine which may be worthy of mention.

There need not be any particular preference for the use of thiamylal (2%); another thiobarbiturate derivative, such as thiopental (Pentothal) sodium, may be administered just as well for temporary hypnotic induction to afford additional sedation during the actual visualization of the glottis and the insertion of the endotracheal tube. Because of the ultrashort effect and the relatively small amount of thiamylal used, recovery from the temporary hypnosis is rapid and in a few minutes the patient is able to communicate with the anesthetists. It is interesting to note that the average amounts of 2% solution of thiamylal used for induction in this series were almost identical in both groups. This may be explained on the basis that the average weight of patients in the two groups did not vary appreciably.

Particular preference is given to succinylcholine, a depolarizing relaxant drug, because of its short duration of action and its easy controllability of administration. The 2% concentration of 40 mg. is used for the endotracheal intubation in this series, although the 0.2% concentration, which is administered by the controlled drip during the surgical procedure, might have just as well served the purpose. As was mentioned earlier, in our technique we maintain the succinylcholine drip at the rate of 8 to 10 drops per minute to prevent the initiation of possible undesirable reflex cardiac arrhythmias from operative manipulations inside the chest.[7]

This concept was upheld in this series by the rate occurrence of dangerous cardiac arrhythmias, except in the one patient who developed a sudden ventricular fibrillation during relatively prolonged and multiple manipulations of the mitral valve. This particular patient had chronic hypertension to start with, and autopsy findings revealed coronary and myocardial pathology.

Inasmuch as we did not obtain continuous electroencephalographic tracings in all patients during the operation, to determine and maintain a steady state of adequate analgesia we depended on the patient's responses to painful stimulation either by spontaneous responsive means or by interrogations. On rare occasions, some patients suddenly moved sufficiently on the operating table to disturb the operating conditions, either from inadequate analgesia or from mere restlessness. In this situation, the rate of the succinylcholine drip was increased temporarily until enough time was allowed for the additional dose of meperidine and/or increased safe concentration of nitrous oxide to put the pat back into an adequate analgesic state. However, to maintain apparent analgesia with a potent relaxant, such as succinylcholine, is certainly unfair to the relaxed, helpless patient. We do not believe that a safe concentration of nitrous oxide alone is potent enough to offer the patient sufficient analgesia in major surgical procedures.

On a few occasions, we tried to maintain and control analgesia in some patients with just the maximum safe concentration of nitrous oxide and continuous succinylcholine drip. These patients showed freedom of response from painful stimuli as long as the dose of succinylcholine drip was sufficient to keep them on the operating table, but, as soon as the rate of the succinylcholine drip was decreased to the point where these patients could manifest the inadequacy of nitrous oxide alone in providing sufficient degree of analgesia, control from their dissenting movements would be difficult. The slight to moderate differences in the average total amounts of meperidine and succinylcholine given between the two groups may be a function of duration of anesthesia rather than the patient's physical status.

We prefer the manual controlled type of respiration for our patients because we feel that we can provide more adequate ventilation. Subjectively, by the feel of the bag, we can ascertain to some degree whether the patient is about to take over his own respiration. Objectively, we can vary the intrapulmonary pressure from the degree of expansion of the lung. Furthermore, our surgeons prefer this type of ventilation since they have been used to working with satisfaction under these conditions. In case there is any sign of spontaneous respiration by the patient, we prefer to control the ventilation by physiological means instead of resorting to administration of drugs. The routine hilar infiltration of a local anesthetic immediately on entrance of the chest cavity proves very satisfying to us in the prevention and management of "bucking" during manipulation of the lung. This particular type of infiltration may be repeated once or twice during the whole operative procedure without detriment to the patient.

It has been recognized for a number of years that the experimental animal, when awake, will tolerate about twice the amount of hemorrhage that it will when anesthetized.[8] This was proved to be true in a fair number of our patients, who, because of the marked fragility of their calcified atrial tissue, had episodes of severe blood loss and were still able to regain their relatively normal homeostatic state after adequate blood replacement.

It is also a well-established clinical thesis that shock or functional impairment of the circulation will often be induced in borderline patients by general anesthesia, particularly during prolonged procedures. These observations tend to denote that general anesthesia exerts an untoward influence on the peripheral vascular bed, on the heart, and on the circulating blood volume, all of which may be implicated in the pathogenesis of shock. Moreover, these effects become more profound and deleterious as the depth of narcosis increases.[9] There are still a few anesthetists who believe that surgical trauma, if severe and prolonged enough, will produce the syndrome of shock unless adequate interruption of the noxious stimuli elicited is instituted by administration of regional anesthetics or by induction of deep general anesthesia.[10] However, there is little evidence to support such a concept, and clinical impressions indicate that noxious surgical stimuli in light planes of anesthesia, more so in the analgesic stage, do not necessarily contribute to the syndrome of shock.

In the eight deaths in this series, we did not find any direct cause and effect relationship between mortality and analgesia. The analgesic state permits activity of reflexes which are advantageous to the patient and which help him maintain his physiological equilibrium. The patient's responses to stress of several kinds, such as anoxia, hypercapnia, trauma, and blood loss, would be optimal. Such protective reflex mechanisms are depressed in direct proportion to the depth of anesthesia. The most probable explanation of the protection might be due to the state of delicate balance of the autonomic nervous system during the analgesic state and that a balanced autonomic nervous system is related to cortical control. With the establishment of surgical anesthesia and its concomitant cerebral depression, one part of the autonomic nervous system becomes preponderant over the other and deleterious reflex activity results from this imbalance.[3] From such consideration has emerged the concept that the anesthetist will serve the patient best in his efforts to overcome the strains and stress which are incident to surgical interference by not overloading with a potentially toxic anesthetic agent. To emphasize the theory of Selye,[11] the anesthetist can aid the general adaptation syndrome of the patient by allowing him as full use as possible of his normal physiologic protective mechanisms. With this idea in mind, it would appear that the present trend of using small amounts of several agents judiciously, each to accomplish its own purpose, and each interfering with the normal physiologic processes to a minor degree, would tend to permit the patient to make use of his defenses to the maximum advantage against the surgical insult to which he is exposed.

Summary and Conclusions

A new method of analgesic technique for the poor-risk patient undergoing thoracic surgery was tested in 100 patients. The analgesic state affords protection to the patient against disturbances of the physiological balance and the effects of the surgical trauma. Although this method of anesthetic management may appear complex, it provides and maintains conditions which are not possible with simpler approaches. The merits of this particular analgesic technique may be listed as follows: 1. The anesthetic agent and supplemental drugs used are almost universally acceptable to all patients. 2. There is minimal disturbance of physiologic mechanisms. 3. A relatively wider margin of safety for the patient and optimal working conditions for the surgeons are provided. 4. There is a relatively shorter and uneventful postoperative course.

The eventual acceptance of this technique by the competent and capable anesthesiologist can only be realized through an open-minded evaluation. However, we would like to emphasize that this particular technique is not for the novice whose knowledge and training in anesthetic management may be considered as inadequate.

1313 E. Ann St. (Dr. Sweet).

References

1. Snow, J.: On Inhalation of Vapour Ether in Surgical Operations, London, J. & A. Churchill, Ltd., 1847.

2. Gwathmey, J. T.: Synergistic Colonic Analgesia, J. A. M. A. **76:**222-225 (Jan. 22) 1921.

3. Artusio, J. F., Jr.: Ether Analgesia During Major Surgery, J. A. M. A. **157:**33-36 (Jan. 1) 1955.

4. Schotz, S.; Bloom, S. S.; and Helmsworth, F. W.: Succinylcholine and Inhalation Analgesia for Major Cardiac and Pulmonic Surgery, J. A. M. A. **163:**345-347 (Feb. 2) 1957.

5. Little, D. M., Jr., and Stephen, C. R.: Modern Balanced Anesthesia: Concept, Anesthesiology **15:**246-261 (May) 1954.

6. Seevers, M. H.; Bennett, H. H.; Pohle, H. W.; and Reinardy, E. W.: Analgesia Produced by Nitrous Oxide, Ethylene and Cyclopropane in Normal Human Subject, J. Pharmacol. & Exper. Therap. **59:**291-300 (March) 1937.

7. Purpura, D. P., and Grundfest, H.: Blockade of Cardiac Synopses by Succinylcholine, Science **124:**319-320 (Aug. 17) 1956. Hitchcock, P.; DiPalma, J. R.; and Catenacci, A. J.: Effect of Succinylcholine on Cardiac Arrhythmias, Fed. Proc. **16:**307 (March) 1957.

8. Essex, H. E.: Anesthesia in Relation to Shock, S. Clin. North America **23:**1212-1220 (Aug.) 1943.

9. Hershey, S. G.; Zweifach, B. W.; and Rovenstine, E. A.: Effects of Depth of Anesthesia on Behavior of Peripheral Vascular Bed, Anesthesiology **14:**245-254 (May) 1953.

10. Evans, E. I.: Studies on Traumatic Shock: Anesthesia in Clinical Shock, J. A. M. A. **124:**473-478 (Feb. 19) 1944.

11. Selye, H.: Alarm Reaction and Diseases of Adaptation, Ann. Int. Med. **29:**403-415 (Sept.) 1948.

THE ROCHESTER, N. Y., HEALTH FORUM

A SUCCESSFUL ADVENTURE IN PUBLIC RELATIONS WITH USE OF TELEVISION

Edward H. Townsend Jr., M.D.
and
Theodore B. Steinhausen, M.D., Rochester, N. Y.

For success in establishing a public health forum it is not enough to choose timely subjects, engage competent speakers, and secure excellent publicity. Data show that the public wants to hear about medicine from the medical profession and that the profession can retain control of publicity, provide subjects and personnel for the program, and remain the sponsor while holding the financial outlay to a minimum. The panel type of program here described was the most successful and easiest to prepare. The participants appeared on television cognizant of their subject, and tape recordings of the rehearsals enabled each to hear the full effect of his own role as well as that of the program as a whole. Experience makes it possible to adapt the program to local conditions, and this endeavor can be rewarding alike to the public, the profession, and the individual participants.

Due to the role played by publicity and advertising in modern life, the medical profession has inadvertently come to be used to further many commercial products and even quasimedical ideas. This and other factors have made the need for a better understanding of the medical sciences by the public more essential than ever. Toward this end several attempts have been made in many geographically dissimilar areas to hold "health forums," but most of these were sponsored by newspapers—not by the medical profession. Newspaper and magazine coverage is and always will be essential to the success of any public program in health, but their role should not become that of the sponsor. The medical profession should remain the sponsor, and on this basic premise the Rochester (N. Y.) Health Forum was founded.

Six years ago it was our privilege to be assigned by the Rochester Academy of Medicine and the Monroe County Medical Society to the task of establishing a public health forum for the dissemination of medical knowledge by local members of the medical profession to the regional public. During these six years, the chairmanship of the governing committee has changed to include several physicians and over 35 television programs have been presented. This continuing success warrants a review of the evolution of this program.

First Phases

In the formation of the Rochester Health Forum, the successful public health forums held in Atlanta, Ga., Dade County, Florida, Detroit, and Buffalo were studied. They seemed to possess one common weakness; each required the public to come to the profession. At this time (one year prior to the founding of the Rochester Health Forum) a public meeting, "Gamma Globulin and Poliomyelitis," was held in the auditorium of the Rochester Academy of Medicine at the height of the subject's emotional appeal to the public. The panel was composed of individuals popular in medical, civic, and political endeavors. The publicity was excellent. The attendance was most discouraging.

As its first program, the Rochester Health Forum again dealt with the subject of poliomyelitis at the inception of the vaccine program and at the peak of incidence not only of the disease but also of the fear. Yet, even with excellent news coverage and publicity, the employment of a locally popular radio, television, and newspaper figure as moderator, and the use of a central auditorium, a very small audience appeared. A second public presentation was presented that same year with the cooperation of a large local chapter of a nationa labor union—one of the few meetings betwee medicine and labor which have dealt purely wit the professional aspects of a medical subject. Th subject was "Cancer." Weeks of preparation, including advance publicity and questionnaires, gav the panel an audience of 900 persons. But such a approach is not applicable to many groups or locales. At the outset, therefore, it became apparent that the public relations of the medical profession would need to invade more aggressively the public media—in this age it centers around television. It was not intended that these forums should replace the constant necessity of physicians availing themselves of all manner of opportunity to present the profession to such small groups as parent-teachers associations and service clubs. These personal appearances remain as essential as at any former time.

The Federal Communications Commission, in licensing television stations, subjects the applicants to a thorough and cautious investigation to insure that the licensee will serve the public interest, convenience, and necessity. Thus, a certain percentage of television time comes to be given to "public service" programs. With this in mind, WVET-TV, a local station, was approached on the possibility of obtaining "free" television time. They were and have remained most cooperative. Thus, the audience, as judged by audience rating surveys, rose rapidly to viewers of over 50,000 television sets. One survey showed that the television program of the Rochester Health Forum had a greater audience than President Dwight D. Eisenhower at the height of his 1955 campaign. This is cited simply to show that the public wants to hear about medicine from the profession. The financial outlay by the medical societies concerned was held to a minimum, and the profession retained control of its publicity.

Thus, the medical profession assumed the offensive in television, and concurrently the television station discovered that this type of program had [redacted] appeal. A successful joint effort was d a smooth working team developed, putting on monthly television shows of er for eight consecutive months each shows are given during the summer The publicity personnel of the television proposed the title "House Call" for the y one-half hour television programs. The l profession continued to provide the sub- d personnel for the program. The television provided the necessary artistry, audiovisual d managerial personnel, while allowing the l profession to retain directive authority.

The Panel Presentation

In the first years, many different types of presentation were attempted. The most successful and easiest to prepare proved to be the panel type. The moderator of the panel may be a physician or a lay person, but he must be carefully chosen, since it is e who must unite the speakers into a coordinated resentation and keep the tempo of the show movg at a pace appealing to the viewers. The number speakers best managed is four, which allows ch speaker ample time to cover his phase of the subject. A few minutes is used for formal presentation of his subject (about one-half the allotted video time), followed by a question and answer period during which the speaker amplifies this subject. This latter period continues even during the "sign off," avoiding the awkward and time-consuming preparations necessary for a perfectly timed poignant end. Thus, the subject matter, rather than the mode of presentation, can be rehearsed.

During the developmental phase of the Rochester Health Forum, questions on the subject to be presented were solicited from several sources and presented to the panel in various manners. After these experiments, it was decided that physicians aware of the questions asked of them on the subject presented could instruct the moderator to ask the panel these several obvious questions. It is important, though incidental, and significant that the Rochester Health Forum has continued to solicit questions from any and all sources, whether the program be public or televized. At no time has the profession regretted this pledge or been embarrassed by the assumption of such a task.

Whatever the choice of the program personnel, it is important that they appear on television cognizant of their subject and its presentation. Sufficient advance notice must be given so rehearsals can be adequate not only for each physician but for the group as well. The Rochester Health Forum found it helpful to tape record rehearsals in order for one to hear the full effect of one's own role as well as that of the program as a whole. In these past six years, the Rochester Health Forum has utilized the services of over 100 physicians in the programs, distributing the load of public relations over the members of the profession.

Subject Matter

Any subject, or any phase of a subject, can be dealt with. The point or "message" of each show must be simply stated and clearly presented. For instance, with a program on congenital heart disease one could make a great many points—and yet by examples the message of one particular program was that some, not all, persons with congenital cardiac disease have correctable defects and that your physician is the one to help you decide. It is important to stress "your physician" and to censor the program so that one does not commit the profession as a whole to a course of action given by one physician-speaker.

One can maintain clear differences of opinion on a subject, and one can truly say what medicine does and does not know. One need not be a constant optimist. Over the years many letters have been received commending the Rochester Health Forum on the manner in which the truth about medicine has been presented.

Also, one can implant many incidental ideas into the audience, i. e., the role of the hospital interns and residents in modern medicine. One oft-quoted comment during the television show on "Childbirth" demonstrates this point. One of the panelists, while speaking of the role of the intern, said: "Remember the intern who assists me today may deliver your daughter tomorrow."

This is true good public relations. As a matter of fact, to lighten one year's program the Women's Auxiliaries of the Monroe County Medical Society and the Rochester Academy of Medicine were allowed to put on a Christmas show. This met with considerable success. It also pointed up the important role played by the wife and family in every physician's life.

Health forums cannot be commercially sponsored. All physicians are aware of the poor showing a now defunct television program gave the profession between the "commercials." The sponsor of health forums must remain the medical profession.

Comment

The Rochester Health Forum is run by a committee small enough to be useful and yet sufficiently large to handle the several chores. The officers have had their tenure of office staggered so that some continuity to the over-all program can be maintained. The function of the committee is not only to produce the shows but also to insure advance publicity and notices and to constantly appraise each show for its full effect on the audience and the profession. To assist in the establishment of the Rochester Health Forum, we served as co-chairmen of the committee for three years.

Each locale will have its own ground rules and *modus operandi*, but it is hoped that by setting forth this experience others might be encouraged to enter the field of public relations. This endeavor has proved to be rewarding to all individual physician participants and valuable to the medical profession. Incidentally, the combined cost of this enterprise to both sponsoring societies is less than $1 per physician per year.

26 S. Goodman St. (7) (Dr. Townsend).

EVALUATION OF THE NEWBORN INFANT—SECOND REPORT

Virginia Apgar, M.D., Duncan A. Holaday, M.D., L. Stanley James, M.B. (New Zealand),
Irvin M. Weisbrot, M.D.
and
Cornelia Berrien, A.B., R.N., New York

The condition of each newborn infant was expressed by a score, the sum of five numbers obtained within 60 seconds after complete birth. The numbers were determined by objective observations of heart rate, promptness and vigor of the first respiratory efforts, and reflex response to certain stimuli, muscle tone, and color. The highest possible score was 10, representing the optimum condition of the infant. The predictive value of such scores is here established by a study of the scores of 15,348 infants, for the death rate among infants scoring 2, 1, or 0 was 15%, while that for infants scoring 10 was 0.13%. The score was found to be a measure of the relative handicaps suffered by infants born prematurely, delivered spontaneously at term, delivered by cesarean section, or subjected to other obstetrical and anesthetic hazards. The lower scores were generally associated with chemical findings characteristic of asphyxia in the blood obtained by umbilical catheterization. The score was especially useful in judging the need for resuscitative measures, such as respiratory assistance.

In 1952, a scoring system was devised to evaluate the condition of infants born at the Sloane Hospital for Women.[1] Its use has increased yearly in various clinics. This report will discuss the incidence of the scores of 15,348 infants, the corresponding death rates, the relation to biochemical studies, and considerations for improving the system. The adoption of this method by the Collaborative Study of Cerebral Palsy has resulted in valuable criticism from other clinics using it for the first time.

The incidence of scores, in all types of deliveries, does not vary significantly from that found in two previous reviews[2] (fig. 1, *top*). Approximately 6% of the infants were severely depressed, 24% moderately so, and 70% were in excellent condition. The incidence in the three major types of deliveries, vaginal vertex, cesarean section, and breech, varies greatly (fig. 2). Over 20% of infants delivered by breech presentation fall in the severely depressed group, while only 12% of those by cesarean section and 3% of those by vaginal vertex delivery score 0, 1, or 2.

The over-all death rates were the same as with a smaller number of patients (fig. 1, *bottom*); 15% of groups 0, 1, and 2 died. When subdivided according to type of delivery (vaginal vertex, 1.4%; cesarean section, 3.8%; breech, 13.3%), breech deliveries showed the highest mortality (fig. 3). This is directly related to prematurity. While 35% of the infants delivered by breech presentation at Sloane

---

From the Anesthesiology Service, the Presbyterian Hospital, Sloane Hospital for Women, Babies Hospital, departments of anesthesiology, obstetrics, and gynecology and pediatrics, Columbia University, College of Physicians and Surgeons.

Read before the Section on Obstetrics and Gynecology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

Hospital were between 500 and 2,500 Gm. (1 to 5.5 lb.), 90% of the deaths were in premature infants.

Since the majority of neonatal deaths occur in premature infants, it was thought wise to examine the scoring system with special emphasis on this group. The following graphs show that the incidence and the death rates of the various scores follow a pattern similar to the entire group (fig. 4).

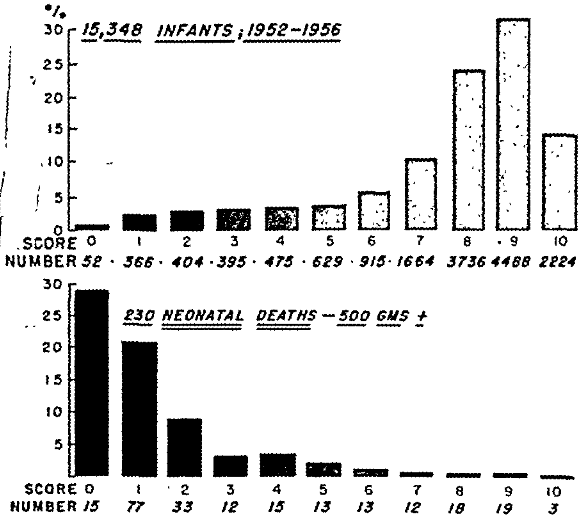


Fig. 1.—Distribution of scores in evaluation of newborn infants in all types of deliveries (*top*) and in evaluation of newborn infants and neonatal deaths in vaginal vertex delivery and cesarean section (*bottom*).

The scoring system has been used as a guide to the need for resuscitation. Since the death rates dropped quite sharply after a score of 4 in the preliminary study, we have used a score of 4 or less as an indication to assist ventilation. During the past two years, we have had an opportunity to check this clinical impression with biochemical studies immediately after birth and can relate the findings to the score.[3] Since the arterial blood of one-quarter of the vigorous infants was 10% saturated or less, it soon became evident that oxygen values alone had no relation to the clinical condition of the infant. However, no infant with good oxygen values in his arterial blood was depressed. If, in addition to hypoxia at birth, an elevated tension of carbon dioxide, a low pH, and low buffer base value existed, the infant was severely depressed.

After using umbilical arterial samples as a better reflection of the infant's condition than umbilical vein blood, it was decided that blood obtained from inside the baby by umbilical catheterization gave the truest values. The methods used have been reported previously[3] and detailed chemical findings presented to th of another communication. In sum- these experiment every instance the pCO_2 in the aware of the questi an in the umbilical artery. Like- presented could ins buffer base values were lower in blood taken from within the infant. All these findings point to the rapid development of respiratory and metabolic acidosis during and immediately after birth.[4] Whether or not these conditions are detrimental to mental and metabolic development remains to be proved, but they can hardly be desirable. The findings stress the importance of prompt treatment by the simple process of ventilation. Intentional delay during the course of delivery is not to be condoned.

With a few exceptions, the more asphyxic the blood values, the lower the score one minute after birth. Using the buffer base value as the measure of the duration of asphyxia, the value in infants with scores of 4 and lower was 29.3 mEq. per liter, while those with scores of 8, 9, and 10 were 36.6 mEq. per liter. This is statistically significant ($p < 0.001$) (fig. 5).

The exceptions remain to be explained and in general are related to the type of anesthesia and medication administered. It has been shown previously that the babies born after use of regional anesthesia in the mother are more vigorous than after a general anesthesia, though skillfully administered.[5] The explanation probably depends on the action of general anesthetic agents in the presence of asphyxia. The drugs used for regional anesthesia may pass through the placenta but do not appear to augment the asphyxic depression of the infant.

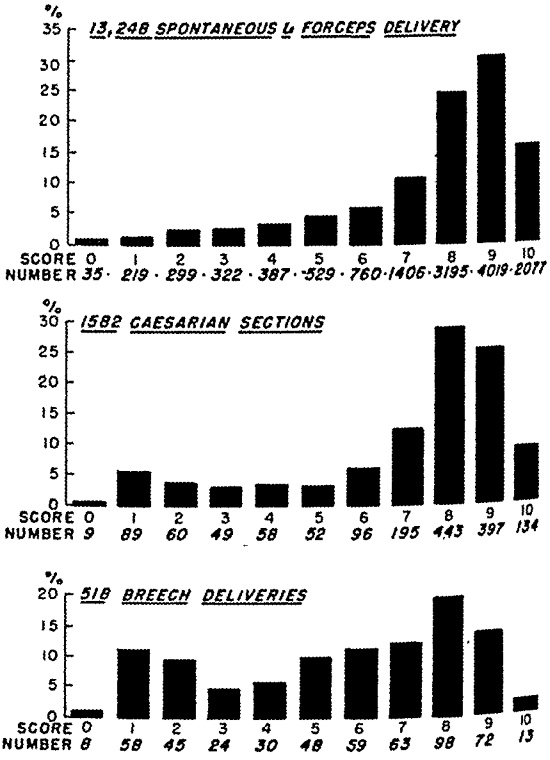


Fig. 2.—Incidence of scores in evaluation of newborn infants in three major types of deliveries.

Three patients with scores of 2 or 3 showed buffer base values well above the average. All three mothers were given anesthetics by inhalation. It is likely that their low scores were due to reversible drug depression, rather than deranged acid-base balance.

Two other patients, with a score of 6, had buffer base values below the average for that score. One of these mothers received spinal anesthesia for delivery of a distressed infant with impacted shoulders. Eighteen minutes elapsed before sustained respiration. The other was a breech delivery of moderate difficulty, with cyclopropane as the anesthetic.

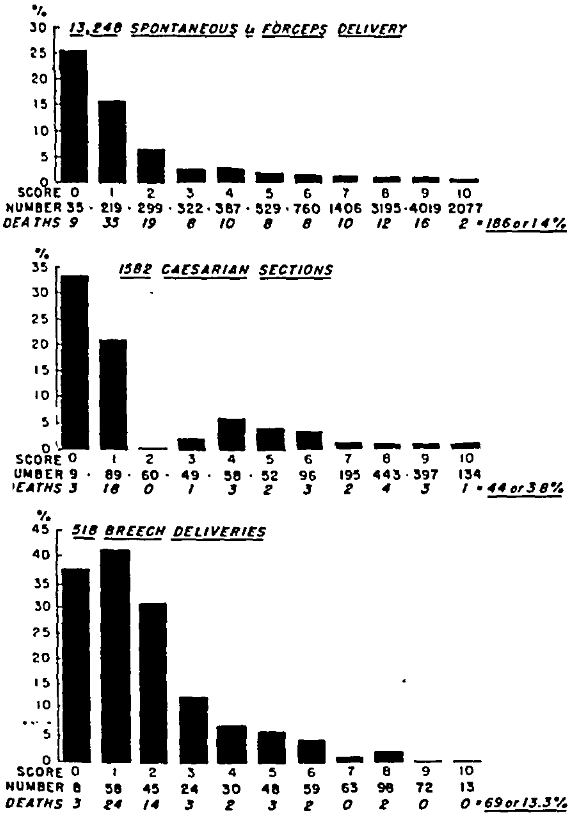


Fig. 3.—Incidence of scores in evaluation of newborn infants and neonatal deaths in three major types of delivery.

Practical Considerations in Using the Scoring System

After a year's trial with two individuals deciding on the score at various intervals after birth, it was decided that 60 seconds after the entire birth of the infant, irrespective of delivery of the placenta, represented the time of most severe depression after birth. In the Sloane Hospital the cord has been cut by this time, and the infant is in the hands of an individual other than the obstetrician. In many hospitals, such is not the case. Those obstetricians who practice slow delivery and delayed cl of the cord until pulsations of the umbilical cease still have the infant in the sterile field. ever, if the obstetrician is reminded of the p of time by another observer, he may assign a s even though the cord is still attached. Two po are given for each of the following vital sign color, respiration, muscular tone, nasal irritabilit and heart rate. All infants with a score of 8, 9, c 10 are vigorous and have breathed within seco of delivery. In this group, scores of 8 or 9 re a lower score for color. The infants with a score of 4 or less are blue and limp and have failed to establish respiration by one minute. With increasing depression the last two vital signs, reflex irritability and heart rate, disappear in that order.

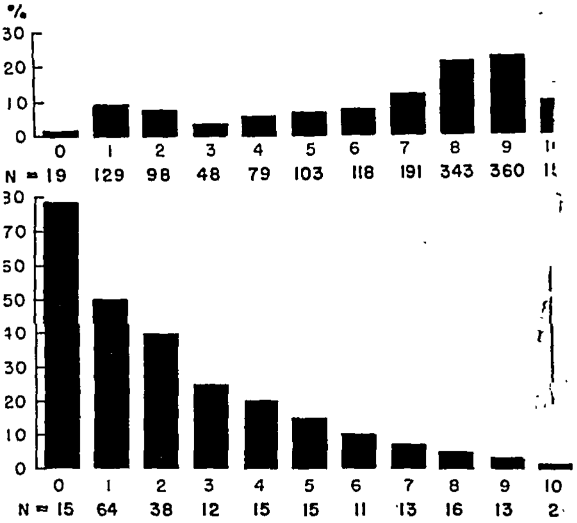


Fig. 4.—Distribution of scores in evaluation of 1,642 pr mature infants (*top*) and of 214 neonatal deaths in prema ture infants weighing 500 to 2,500 Gm. (1 to 5.5 lb. (*bottom*).

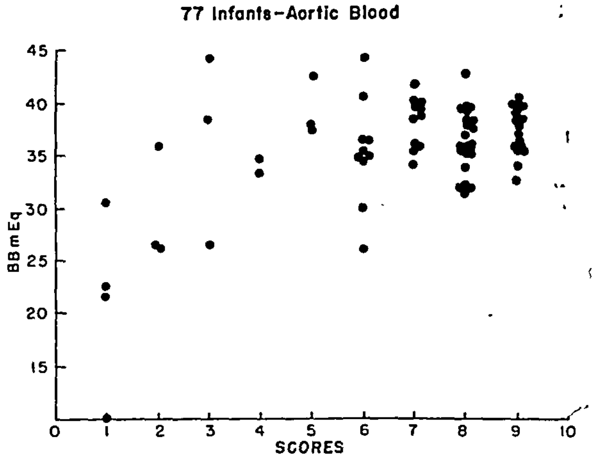


Fig. 5.—Relation of buffer base values to scores in evaluation of aortic blood from 77 newborn infants.

six years of experience, the method has und simple to teach to any personnel regu- the delivery room, whether obstetricians, siologists, pediatricians, medical students, duate or student nurses. Whoever has the directly in his care at one minute can best n the score. When two or more people decide ndently, we find a range of one value above below a decided score to be the widest varia- n. This occurs chiefly in the mildly depressed up, i. e., score 5, 6, 7. Variation is rare in in- ts with high or low scores. There is also less riation if the score is decided quickly.

In clinics where delayed clamping of the cord routine, the test for reflex irritability with nasal heter is not satisfactory. Also, when the infant ving lustily, a sneeze may not be seen. A brisk ntial slap of the soles of the feet has been to be a simpler and more effective method ng this response. A cry is given a value of grimace or movement a value of 1, and no

Method of Scoring in Evaluation of Newborn Infant[*]

	Score†		
Sign	0	1	2
eart rate	Absent	Slow (<100)	>100
spiratory effort	Absent	Weak cry; hypoventilation	Good; strong cry
uscle tone	Limp	Some flexion of extremities	Well flexed
flex irritability esponse of skin timulation to feet)	No response	Some motion	Cry
olor	Blue; pale	Body pink; extremities blue	Completely pink

---

[*] aluation 60 seconds after complete birth of infant (disregarding rd and placenta).

† Score of 10 indicates infant in best possible condition.

eaction, 0. Although the catheter may not be used o test reflex irritability, it is of value in the delivery room diagnosis to exclude atresia of the nose, sophagus, duodenum, jejunum, or rectum.

All criteria are not of equal importance. With he introduction of the scoring system, it was felt hat if each of the five criteria was weighted with a formula to give it proper significance, the system would become so complicated that it would not be used at all. Our first effort was to have the evaluation system used widely. Recently, after reports from individuals[6] and from advisory board of the National Institute of Neurological Diseases and lindness as to the relative value of the five criteria, there is no doubt that the first two, heart rate and respiratory effort, are much more important than the next two, muscle tone and reflex irritability. Color is of the least importance. There is no objection whatsoever to revising the numerical situation to provide more accuracy, but deviations from the original scoring system should be clearly stated in such reports.

Muscle tone evaluation is performed visually. The tonus of a well-flexed infant is as obvious as the absence in a completely flaccid one. Anything in between receives a value of 1, rather than 2 or 0. With the recent fortunate increase in personnel in the delivery room, due to the National Institutes of Health program in 16 cooperating hospitals, objective measurements of muscle tone have been undertaken. To date, we are unfamiliar with the value of these detailed observations.

Serial scoring is of value. Although we have no statistics to prove the clinical impression as yet, it appears that the longer a low score stays low, the worse the prognosis for survival. If a score of 0, 1, 2 does not improve by 15 minutes, the prognosis is extremely grave. Only occasionally does a good score, such as 8, 9, 10, drop after one minute. This is almost always associated with enthusiastic efforts to aspirate the pharynx or to empty the stomach too soon. The cause is usually from the catheter tip touching the vocal cords, in a vigorous infant, and causing reflex laryngospasm. Other causes are respiratory obstruction or hypoventilation from drug depression. These complications are completely preventable.

A working plan for the scoring system is presented below. The only changes from the original chart are the omission of the word "irregular" to describe respiration and the new method for testing reflex irritability.

Summary

The incidence of scores and death rates in the evaluation of 15,348 newborn infants at the Sloane Hospital for Women varies in the three major types of deliveries: vaginal vertex, cesarean section, and breech presentation. This method of evaluation is useful in analyzing premature infants. Biochemical evidence corroborates the value of this scoring system. The infant is evaluated according to color, respiration, muscular tone, irritability, and heart rate.

622 W. 168th St. (32) (Dr. Apgar).

This study was supported by a research grant from the National Institutes of Health, Public Health Service.

References

1. Apgar, V.: Proposal for New Method of Evaluation of Newborn Infant, Anesth. & Analg. **32:**260-267 (July-Aug.) 1953.

2. Apgar, V.: Comparison of Results to Infant Following Maternal Regional or General Anesthesia for Delivery, New York J. Med. **57:**2955-2956 (Sept. 15) 1957. Reference 1.

3. James, L. S., and others: Acid-base Status of Human Infants in Relation to Birth Asphyxia and Onset of Respiration, J. Pediat. **52:**379-394 (April) 1958.

4. Weisbrot, I. M., and others: Acid-base Homeostasis of Newborn Infant During First 24 Hours of Life, J. Pediat. **52:**395-403 (April) 1958.

5. Hingson, R. A., and Hellman, L. M.: Anesthesia for Obstetrics: Labor, Delivery, Infant Care, Philadelphia, J. B. *Lippincott Company,* 1956.

6. Beecher, H. K., and Auld, P.: Personal communication to the authors.

LOWERING BLOOD LIPID LEVELS BY CHANGING FOOD PATTERNS

Helen B. Brown, Ph.D.
and
Irvine H. Page, M.D., Cleveland

It is agreed that the reduction of the incidence and severity of atherosclerosis might depend, in part, on a reduction of the amount of animal fat in the national diet. Substitutes must be found for the foods that are to be avoided. The use of vegetable oils makes it possible to provide much the same kinds of food to which people are accustomed, and foods so prepared require no individual preparation for the patient since they are suitable for the whole family. This was demonstrated first by a 21-day test in four active young physicians and later by a study, continued for 6 to 24 months, in 16 patients with atherosclerosis. The principal source of fat was a mixture of 94% cottonseed oil, 1.5% monostearin, 1.5% distearin, and 3.0% tristearin. Data on serum cholesterol levels showed that the food pattern here described reduced the serum cholesterol levels in normal and in many hypercholesteremic people. In some it was more effective than the low-fat diet. The food pattern is sufficiently developed to suggest its use on a larger scale.

There is strong circumstantial evidence that the evel of blood cholesterol is causally associated ith the incidence and severity of atherosclerosis. he level in turn may be in part controlled by the uantity and quality of fat in the diet. While neither f these propositions has been proved,[1] enough is nown to suggest the value of wider spread experinents to determine their validity.

The recent finding that the serum cholesterol evel may be reduced by some unsaturated vegeable oils[2] makes such a test at least possible. Up o the present, use of these oils has largely been in formula diets[3] and not very palatable mixed diets.[4] Further, the experiment was almost by necessity short-term because the diets were not prepared for long use.

While this is not the time for radical change in the diet of the public, most investigators would agree that a reduction in the amount of fat in the diet is desirable. There are, however, groups of patients that include those with family history of premature heart attacks, overt hyperlipemia, or both, in whom a special diet or, much better, a "way of life" is a therapeutic necessity. The latter group has been our first concern, but with experience gained it has become evident that the objective of lowering the serum cholesterol level and avoiding obesity can be achieved with foods prepared in most cases quite as palatably as is current practice.

Food Patterns

Diet has become an unfortunate word. It means to most people weight reduction or a hospital diet, restrictive and unappetizing. The dictionary is kinder to the word: it comes from the Greek *diaita,* a manner of living. And so diet involves not only food but the attendant human values of conversation, companionship, and aesthetic satisfaction. Tamper with a man's food and you tamper with the basic pattern of his life.

It has been our hope that a way of life may be evolved which will slow the rate of development of atheroma with its attendant heart and brain disease. To attempt this we realize that first we must think in terms of individuals before populations. The individual must be able and willing to follow the recommendations in his business and social life without making food the main concern of existence.

An acceptable food pattern requires that foods be readily purchasable, easily prepared, suitable for the whole family, and adaptable to varied cultural backgrounds. A simple prohibition of foods without the offer of something else as satisfying is futile. Witness the 6% rise in cigarette consumption after warnings against lung cancer and heart disease.

Serum cholesterol level may be reduced by two essentially different diets. One is the strict low-fat diet and the other is a diet containing a minimum of animal fat along with sufficient vegetable oil to provide a normal total fat intake. The low-cholesterol diet is essentially one low in animal fat and is not considered separately here.

These two intrinsically different diets, unfortunately, are sometimes misinterpreted as being interchangeable. The low-fat diet omits as much of all fats as possible from all food sources. It provides only 10 to 15% of the total calories as fat, most of which is animal fat (table 1). The vegetable oil diet is basically the low-fat diet with the addition of vegetable oils. This diet substitutes vegetable oil for most of the animal fat eaten in a normal diet. It is important to stress the substitution of one kind of fat for another. The addition of a few tablespoons of oil to a basically normal food pattern

---

From the Research Division of the Cleveland Clinic Foundation and the Frank E. Bunts Educational Institute.

in which 42% of the calories is animal fat (and hydrogenated vegetable oil) will not lower the serum cholesterol level.[5]

Low-Fat Diet.—Our version of the low-fat diet contains 30 Gm. of fat daily. This is mostly animal fat, and substantially all of it is eaten at one meal as suggested by Wilkinson.[6] The low-fat diet eliminates fat—containing dairy products, table (butter and margarine) and cooking (lard and hydrogenated shortenings) fats, egg yolks, and nuts. Intake of meat fat is reduced by avoiding pork and by use of lean beef instead and by frequent use of veal, poultry, and fish. By having the meat fat all in one meal, not only the catabolism of fat may be more complete but also the person is assured of one satisfying dinner each day. For the fat-free lunch, low-fat (less than 1 Gm. per serving) fish and poultry are suggested. Other practical suggestions include low-fat cookery, low-fat recipes, and lists of low-fat foods and meats. A list of meats, usually obtainable in restaurants, is included, which will provide no more than 5 Gm. of fat. Such recommendations have been collected in a low-fat cookbook, mimeographed and furnished to each patient.

TABLE 1.—*Composition of Normal, Low-Fat, and Vegetable-Oil 2,000-Calorie Diets*

Composition	Type Diet		
	Normal	Low-fat	Vegetable-oil
Fat, Gm.	90	30	90
Animal	66	15	15
Hydrogenated	11	15	0
Vegetable oil	13		75
Protein, Gm.	60	70	70
Carbohydrate, Gm.	235	363	225

This low-fat diet has been followed successfully at home, at work, and at play. However, in spite of these suggestions, the diet tends to become monotonous after a year or so. It is a diet in the unpleasant sense of the word because its variety is limited. There are currently few commercial food products which meet its requirements. The production of more such foods should be a challenge to the food industry.

Vegetable Oil Food Pattern.—Addition of vegetable oil to the low-fat pattern makes possible greater variety and palatability. Our current vegetable oil pattern is composed of carbohydrate, 45% of the calories, protein 14%, and fat 41%. Seven per cent of the calories derive from meat and 34% from cottonseed oil. Thus, for example, a daily intake of 2,000 calories consists of 225 Gm. of carbohydrate, 70 Gm. of protein, and 90 Gm. of fat—meat providing 15 Gm. of fat and vegetable oil 75 Gm.

This pattern is similar to the food pattern followed by Americans, in which 85% of the fat is from animal and hydrogenated fats and 15% from vegetable oils (table 1).[7] Vegetable oil replac animal fat in this food pattern; 17% of the fat is animal and 83% of vegetable origin.

One chemical characteristic of fats is measur by their iodine value, which indicates their deg of unsaturation. Animal fats, the popular hyd genated shortenings, and tropical nut oils such coconut oil and cocoa butter are relatively hig saturated and have low iodine values (10-80). Sal nut, and seed oils contain a large proportion unsaturated fatty acid, primarily linoleic, and h high iodine values (105-138). Some of the unsa rated fatty acids are essential to the proper nu tion of rats and other mammals. Linoleic acid is "essential fatty acid" which is not synthesized the body and must be supplied in the diet.

The degree of saturation of an individual determines the effect on the serum cholesterol le when the fat is taken as the only source of diet fat, as in so-called formula diets.[3a] Saturated f with iodine values below 90, such as those pres in dairy products, meats, eggs, margarines, and hydrogenated shortenings, tend to increase the serum cholesterol level; relatively unsaturated vegetable oils with iodine values above 90, rich in linoleic acid, tend to decrease the serum cholesterol level. When saturated and unsaturated fats occur together in the diet, the hypercholesteremic tendency of each gram of saturated fat can be counteracted by about 3 Gm. of unsaturated fat.[3b] Serum cholesterol level reduction occurs when the unsaturated fat supplies from 30 to 40% of the calories in the diet.[8] But such oils have little effect when taken in addition to the usual amount of saturated fat present in normal American foods.[9] These facts have been determined by special "formula" diets or by carefully controlled diets of mixed foodstuffs. Valuable as they are in tests, such diets are unpalatable and impractical for common use. We have tried to transform the diet formula into an appetizing and varied food pattern.

Practical Administration of Vegetable Oil Food Pattern

Reduction of Saturated Fat in Food Pattern.—One of the most serious problems to the cook is how to limit animal fat and yet provide adequate amounts of high-grade protein. We have solved the problem by substituting protein foods low in animal fat for those high in it. Much of this fat can be avoided by eliminating butter, whole milk, cream, cheddar cheese, egg yolks, and products containing these in quantity. Skimmed milk, dry cottage cheese, and egg whites, each in varied forms, provide first quality protein.

Fat in meats, fish, and poultry varies from less than 1 Gm. to over 30 Gm. per serving. Meat fat can be kept to 15 Gm. a day, as suggested for the low-fat diet, by proper selection of meats. We have listed the meats for our patients according to the fat provided per serving, including a list for restaurant use. These choices do not affect the normal quantity or quality of the protein while still limiting the saturated fat intake.

Further reduction of saturated fats is accomplished by avoiding oleomargarine, hydrogenated shortenings, coconut, chocolate, cocoa, and foods made from them. The same low-fat cooking techniques used for the low-fat diet also contribute to reduction of saturated fat in the vegetable oil food pattern.

Substitution of Vegetable Oil for Animal Fat.—Cottonseed oil and soybean oil are the only oils with the proper chemical characteristics for use in the vegetable oil diet, which are, at the same time, available in sufficient quantity in the United States for common use.[10] Others, such as corn and peanut oil, which have proved valuable for serum cholesterol reduction, are marketed only in small quantities.

All fats and oils produced for food in the year 1955-1956 in the United States amounted to a little more than 10 billion pounds.[10] Over half of this was comprised of unsaturated oils in the following proportions: soybean oil, 31.1%; cottonseed oil, 18.7%; corn oil, 2.7%; and peanut oil, 0.7%. Corn oil is already near the peak of production possibility. One bushel of corn produces only 0.75 lb. of oil as compared with 11 lb. from a bushel of soybeans. If all the corn raised in the year cited had been diverted to corn oil food products, it would have supplied only 7% of the total edible fats produced in that year. Obviously any widespread use of oils would require the utilization of cottonseed and soybean products.

We have used a "modified" vegetable oil, prepared for this study by Dr. Fred H. Mattson of the research and development department of Procter and Gamble Company, which will be referred to as "M." It consists of 94% cottonseed oil, 1.5% monostearin, 1.5% distearin, and 3.0% tristearin. About 11 to 21% of these additives are absorbed.[11] This shortening can be made into a spread for bread, can be used as shortening for baked goods, and will emulsify in a blender with nonfat milk solids to yield reconstituted "milk," "cream," or "ice cream," of any desired fat content. The advantages of "M" over commercial cottonseed oil are its blandness and this ability to emulsify. But no special product is necessary for the vegetable oil food pattern. Commercial corn, cottonseed, or soybean oils are excellent for cooking and baking. Two or three teaspoons of such oils added to each serving of a low-fat food converts it to a satisfying, flavorful product. These uses are in addition to their more common use as salad oils.

We have not yet determined the dietary effect of natural foodstuff containing vegetable oil, such as nuts, on the serum cholesterol level. Fried foods have also been avoided because the amount of oil absorbed by them and the chemical changes which occur during frying are both uncertain. These problems are under study.

Research Kitchen and Patient Instruction.—The practical aspect of our dietary project center is the special research kitchen (Mrs. Jean Perry Spodnick, dietitian in charge; Miss Margaret Foust, head of the Cleveland Clinic Hospital dietetics department) where weighed meals are prepared, low-fat cooking methods tested, sample dishes prepared for fat analysis (Mrs. Ann Wahl Scanu, in charge), and recipes tested and developed. We have borrowed recipes and ideas from many sources.

Our continuing search is for desirable substitutes for the foods which must be avoided. Large appetites can be satisfied with large servings of veal, fish, and poultry. We have attempted to obtain the patient's cooperation by removing the feeling of guilt when home or business circumstances make the food pattern difficult to follow. A full discussion of such circumstances has often provided a solution for the difficulties.

TABLE 2.—*Vegetable-Oil Diet Pattern and Sample Menu Served in Tests*

Food Pattern*	Menu for June Day
Breakfast	**Breakfast**
Fruit, 1½ servings	Melon
Cereal, 100 Gm.	French Toast (made with egg white)
Bread, 45 Gm.	Maple Syrup
Spread, 50% "M", 10 Gm.	Spread
"Cream", 20% "M", 60 Gm.	Skim Milk
Skim Milk, 150 Gm.	Coffee
Sugar, 10 Gm.	"Cream"
	Sugar
Luncheon	**Luncheon**
Fish or substitute, 100 Gm.	Tuna Patties
Vegetables, 20%, 100 Gm.	Catsup Sauce
Vegetables, 5% 100 Gm.	Tossed Garden Salad
Vegetables, 10%, 100 Gm.	French Dressing
Bread, 30 Gm.	Nut Tree Bread
Spread, 50% "M", 10 Gm.	Spread
"Cream", 20% "M", 60 Gm.	Mint Sherbet
Fruit, 1¾ servings	Coffee
Sugar, 10 Gm.	"Cream"
	Sugar
Dinner	**Dinner**
Lean meat, 150 Gm.	Beef and Liver Creole
Vegetables, 20%, 100 Gm.	Baked Potato
Vegetables, 5%, 100 Gm.	Fresh Asparagus Spears
Vegetables, 10%, 100 Gm.	Celery Curls
Bread, 30 Gm.	Hard Roll
Spread, 50% "M", 10 Gm.	Spread
"Cream", 20% "M", 60 Gm.	Strawberry Tart
Fruit, 1 serving	Coffee
Dessert (standard recipe), 1 serving	"Cream"
"M" oil, in dessert, 17 Gm.	Sugar
"M" oil, in cooking, 20 Gm.	
Sugar, 10 Gm.	

* Food pattern supplies about 2,500 calories. Amount of animal fat and "M" oil are kept constant each day. Fruits, vegetables, and cereals are interchanged, as shown in sample menu.

Instruction includes the serving of several meals from the research kitchen, demonstrations of the preparation of special "M" products, and presentation, with discussion, of our "Vegetable Oil Diet Instruction and Recipe Book." Individual monthly conferences give us a good estimate of how well the food pattern is being followed. At this time the patient is weighed, his blood sample taken for analysis, and his problems discussed with physician and nutritionist.

Advantages and Disadvantages of Vegetable Oil Food Pattern.—Use of vegetable oils makes it possible to provide the same kinds of food to which people are accustomed. Vegetable oil foods require no individual preparation for the patient, since they are suitable for the whole family. They allow added calories to be supplied easily, which is an advantage over the low-fat diet.

The principal disadvantage is that the usual commercial foods are not necessarily prepared with vegetable oil, and hence more home cooking is necessary. Dinners out with friends and restaurant meals present problems. These disadvantages are common to all special diets. In this regard, vegetable oil food recommendations resemble a therapeutic diet rather than a food pattern.

TABLE 3.–*Dietary Components and Sources of Fat and Protein Used in Diet Tests*

	Vegetarian Diet		Vegetable Oil Diet	
Dietary Components*	Gm.	Calories, %	Gm.	Calories, %
Carbohydrates	308.0	48.4	296	46.3
Protein	87.0	13.6	87	13.7
Egg albumin	13.0	...	...	...
Meat	...	...	41	...
Milk	46.0	...	20	...
Vegetable and cereal	28.0	...	26	...
Fat	107.5	38.0	113	40.0
Animal	0.0	0.0	12	4.2
"M" oil	96.0	33.9	89	31.6
"Basic"†	11.5	4.1	12	4.2

* Total calories, 2,550.
† Fat contained in cereals, fruits, and vegetables.

The greatest danger to the logical development of an effective food pattern is the premature claims for the virtues of any one particular feature of the food pattern without proper evidence to back it and the rush to capture the market with preparations of still unproved value. The many inevitable failures will not increase public confidence in those changes which might be desirable.

Vegetable Oil Food Pattern

The effectiveness of this food pattern for reducing the serum cholesterol level was demonstrated both in two-to-three-week weighed diet tests in which the subjects ate all their meals from our diet kitchen and in two to eight months continuing trial of the food pattern at home. Many patients were subjects of both the diet test and the home trial.

The weighed diet tests supplied an average of 44% of the calories as carbohydrate, 14% as protein, and 42% as fat, with sufficient calories to maintain weight. The fat content of the foods was determined by analysis [12] as follows: meat, 4% total calories; "M" oil, 33%; and all other foods, including fish, 5%. Table 2 gives an example of the types of food served.

Food supplies for the entire experimental period were stored before the test began, to insure uniformity. Bread was from the same baking, chicken from the same flock, meat from the same cut, and canned goods from the same pack. All food servings were weighed. Each lot of "M" spread and "cream" was analyzed by petroleum ether extraction [12a] basic food servings including fish were analyzed for fat after grinding, acid hydrolysis, and ether extraction.[12b] A sample of each meat serving was set aside for analysis and pooled according to the kind of meat and analyzed.[12b]

The test periods were from 11 to 21 days. Weight was recorded daily before breakfast and caloric intake altered to maintain the weight to within ± 2 lb. Food was completely eaten. The subjects were sufficiently cooperative to inform the kitchen of dislike of a single food so that a substitute could immediately be prepared. This rarely occurred. All subjects were encouraged to be physically active. The normal young men and women, employees of the Cleveland Clinic, carried on the usual responsibilities and social life. Some of the patients with elevated serum cholesterol levels came into the hospital on the convalescent floor but were out of doors daily. Others came in for all their meals to the research kitchen from their normal activities.

Blood samples were drawn at the beginning and end of the test as well as at five-to-seven-day intervals during the test. Total cholesterol level was determined in each sample and serum lipid fractions and lipoprotein levels ($-S_{1.21}$, or negative *sedimentation or flotation rate at density*$_{1.21}$, determined in the ultracentrifuge) at the beginning and end.

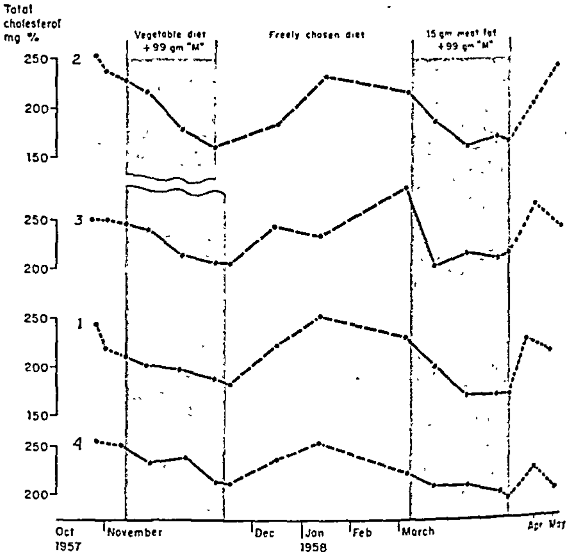


Fig. 1.–Serum cholesterol level changes in normocholesteremic individuals consuming vegetarian diet with "M" cottonseed oil and "M" vegetable oil diet pattern for 21-day weighed food test served from research kitchen.

Effect of "M" Oil on Lipids of Normocholesteremic Persons.–The "M" oil was made the only significant source of fat for a 21-day test in four active young physicians. Vegetables, fruits, cereals, bread, skimmed milk, egg whites, and "M" constituted the vegetarian diet (table 3). Serum cholesterol values were about 250 mg. per 100 ml. during the control period on freely chosen foods. These levels dropped 40 to 80 mg. by the end of the test period (fig. 1 and table 4). The lipoprotein pattern was normal and remained so; triglyceride fractions were approximately normal. Within 30 days after the test, when the subjects were again on freely chosen foods, the serum cholesterol had returned to its control level.

Table 4.—*Average Serum Cholesterol Levels in Individuals Consuming Normal, Low-Fat, and Vegetable Oil Diets*

				Normal		Vegetarian		Vegetable Oil	
Subject*	Sex	Age, Yr.	Diagnosis, (See Key†)	Serum Cholesterol Level, Mg./100 Ml.	Determinations, No.	Serum Cholesterol Level, Mg./100 Ml.	Determinations, No.	Serum Cholesterol Level, Mg./100 Ml.	Determinations, No.
Normocholesteremic Individuals									
1	M	27	normal	232 240	2 2	182‡ ...	1 ..	... 170‡	.. 3
2	M	30	normal	246 226	2 2	160‡ ...	1 ..	... 165‡	.. 3
3	M	26	normal	250 258	2 2	207‡ ...	2 ..	... 213‡	.. 3
4	M	26	normal	253 239	2 2	214‡ ...	2 ..	... 198‡	.. 2
5	F	30	normal	259	2	...	..	202‡	4
6	M	51	1b,5	259	2	...	..	153	2
Hypercholesteremic Individuals									
						Low-Fat			
7	M	38	1c,d	260§	3	232	7	229	3
8	M	45	1a,c,d	271§	2	206	15	202	4
9	F	24	3	310	3	...	..	257	5
10	M	58	6	319	2	...	..	240	3
11	M	48	2	317‖	6	282§	3	232	3
12	M	55	1c,d	337‖	2	255§	3	250	5
13	F	59	1g,2	330	2	260	3	277	3
14	M	44	1c,d,g	356	4	...	..	293	5
15	M	41	1a,c	396	3	376	6	304	2
16	M	63	4,5	419	1	280	12	253	7
17	M	54	1c,d,e	487	2	319	5	268	3
18	M	38	1a,c,f,3,5,6	537	4	450	6	463¶ 408# 500**	4 9 4
19	F	55	1a,c,e,5,6	547	3	478	7	456	2
20	F	63	1c,6	548	2	322	3	292	5
21	F	57	6	664	2	429	11	435	6

---

* Individuals are listed in ascending order of cholesterol concentration on normal diet. Periods of weight loss or fever are omitted from averages. All had normal thyroid function as judged by radioactive iodine uptake, and normal glucose tolerance test, except for diabetic patients.

† Key: 1, atherosclerosis—a, angina pectoris, b, cerebral, c, heart disease, d, myocardial infarction, e, obliterans, f, renal, and g, general; 2, diabetes; 3, familial hypercholesteremia; 4, fatty liver; 5, hypertension; and 6, xanthomatosis.

‡ Serum cholesterol level during 21-day weighed food test served from research kitchen.

§ Hypercholesteremic previous to coming to Cleveland clinic; on self-selected low-fat diet, estimated fat intake 40 to 60 Gm. per day.

‖ Cholesterol level determination done in another laboratory.

¶ 30 Gm. vegetable oil per day.

# 50 Gm. vegetable oil per day.

** 100 Gm. vegetable oil per day.

The same subjects underwent a similar test except that the diet contained meat, supplying 15 Gm. of meat fat in addition to the "M" oil (table 3). Again the cholesterol levels fell 40 to 80 mg. and returned to the preexperimental levels after 30 days on freely chosen foods (fig. 1).

Cottonseed oil "M" successfully reduced the serum cholesterol level well below that present in normal persons with a free choice of foods when the oil supplied 34% of the calories. This was also true when 15 Gm. of meat fat, providing 5% of calories was included in the diet in addition to "M" oil.

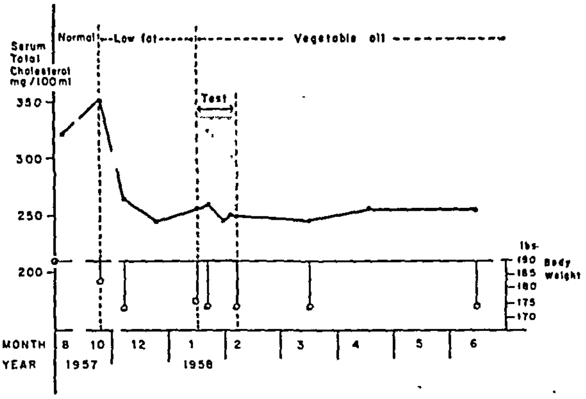


Fig. 2.—Normal cholesterol levels attained in patient receiving low-fat diet, maintained on "M" food pattern, including 21-day test period in which weighed foods were served from research kitchen (table 4, subject 12).

Vegetable Oil Pattern in Hypercholesteremic Patients.—Sixteen patients with atherosclerosis, among whom several had xanthomatosis, myocardial infarction, diabetes, and hypertension were studied (table 4).

Control blood samples were taken covering periods up to four weeks until there was reasonable uniformity in serum lipid values. These 16 have continued on our dietary study for 6 to 24 months.

Thirteen of these patients were placed initially on low-fat diets for 3 to 15 months, and then all were given the vegetable oil food pattern. The average serum cholesterol levels are given in table 4, the patients being arranged only according to their hypercholesteremia on freely chosen foods.

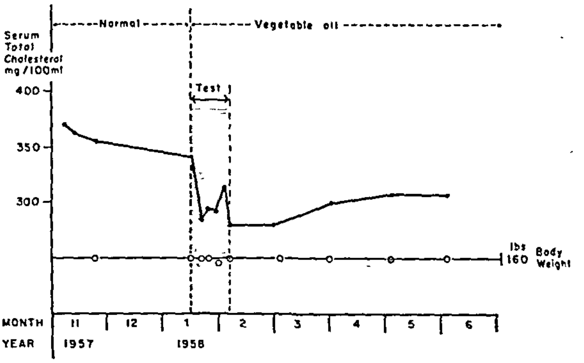


Fig. 3.—Normal cholesterol level attained in patient on "M" vegetable oil food pattern, including 21-day test period in which weighed foods were served from research kitchen (table 4, subject 14).

Cholesterol values of 300 mg. per 100 ml. or less were reached by three patients on the low-fat diet and were maintained on the "M" food pattern. An example is shown in figure 2. Normal values were attained by three other patients on the "M" food pattern alone (fig. 3). Four of the patients exhibited reduction of cholesterol levels, but not to normal, on the low-fat diet. The "M" food pattern brought their levels to normal. The values of one of these patients is shown in figure 4.

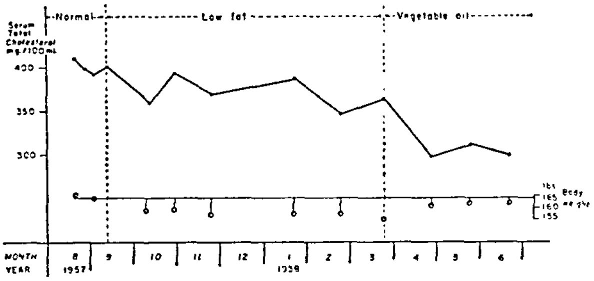


Fig. 4.—Slight reduction of serum cholesterol level on low-fat diet, and further reduction to 300 mg. per 100 ml. in patient on vegetable oil food pattern (table 4, subject 15).

High cholesterol values were still present in three patients, though the low-fat diet had produced some reduction. In these individuals the "M" food pattern did no more (fig. 5).

Elevated serum cholesterol levels fell promptly in the two diabetic patients on the "M" food pattern. The pattern was adjusted to their carbohydrate requirements, providing 33% of the calories as carbohydrate, 21% as protein, and 46% as fat (meat fat 5% and "M" 41%). One of the diabetics was changed to the low-fat diet because of weight gain. Cholesterol values did not rise. The one hypertensive, normocholesteremic patient had a drop of 100 mg. in serum cholesterol level on the "M" food pattern.

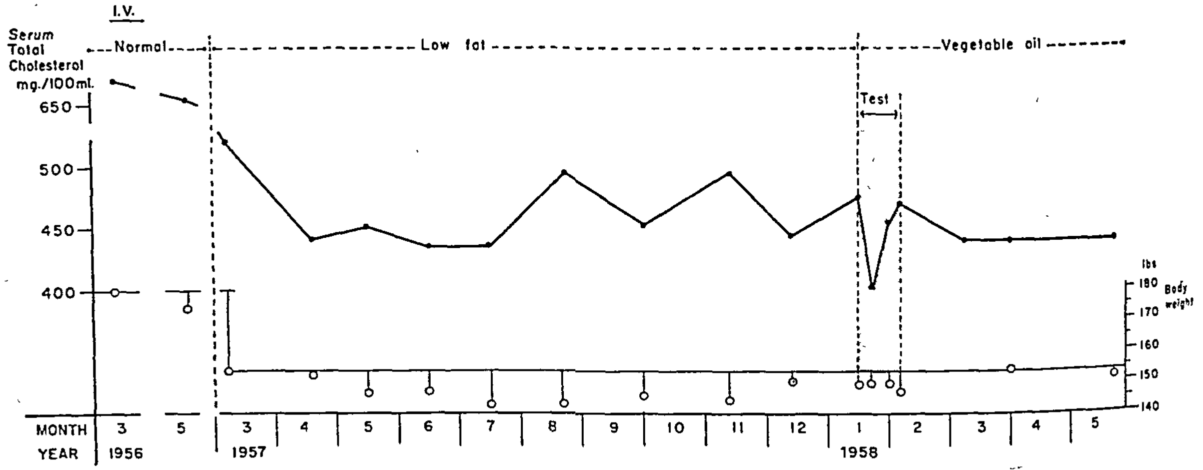


Fig. 5.—Hypercholesteremia persisting in patient eating low-fat diet and vegetable oil diet, including 21-day test period in which weighed foods were served from research kitchen (table 4, subject 21).

Both the low-fat and "M" food patterns effectively reduce serum cholesterol levels, but in some hypercholesteremic patients the "M" pattern exerts a greater reduction. A few patients with severe essential hypercholesteremia respond only moderately to either food pattern.

Elevated low density lipoprotein and triglyceride levels tend to be less effectively reduced than serum cholesterol levels. The triglyceride fraction, after an initial period of reduction, returns to its former level. These and other changes in lipid constituents will be reported in detail later with Dr. Lena Lewis and Dr. Harriet Dustan.

Comment

Reduction of serum cholesterol levels to or near normal was achieved by either a low-fat diet or the vegetable oil food pattern. Serum cholesterol levels fell within a few days or weeks with either type of diet. In some individuals the level was lower on the vegetable oil food pattern than the low-fat diet, *and in all individuals it seemed to be much more* steady (fig. 4 and 5). This steadiness is also demonstrated in patients who went off the diet briefly. One patient went on a fishing trip and ate whatever was provided, including fried fish daily. At the end of a week his serum cholesterol level had risen only 25 mg. Another patient treated himself to prime steaks for two weeks while on the "M" food pattern. His cholesterol level rose 40 mg., but on the low-fat diet, one day's indulgence in ham increased it 70 mg. Clearly, the serum cholesterol level is less variable with the vegetable oil pattern than with the low-fat diet.

A partial explanation for the action of these diets on serum cholesterol lies in the nature of the fat they contain. The normal food pattern supplies sufficient saturated fat to keep the cholesterol level relatively elevated. The low-fat diet reduces the saturated fat intake to an amount that does not affect the concentration of serum cholesterol, and so the cholesterol level is lower than on usual diet. The vegetable oil food pattern is effective in decreasing serum cholesterol level because it not only curtails intake of saturated fats below the hypercholesteremic concentration but also increases the intake of unsaturated vegetable oils to the extent that it exerts a hypocholesteremic action. This double action may be one explanation for the greater effectiveness of the vegetable oil food pattern over the low-fat diet in some patients and for the ineffectiveness of the addition of a few tablespoons of vegetable oil to a basically normal food pattern high in saturated fats.

The vegetable oil food pattern differs from traditional diets in its flexible choice and preparation of food while still conforming to the basic requirements of the pattern. By the use of vegetable oils, foods low in animal fat may be made sufficiently palatable so that people ordinarily will eat them with relish. Skillful use of these oils can make the difference between a tasteless diet and a food pattern not much different from the average American food customs. While the dishes are not perfect, still they are a vast improvement over the usual suggested diets.

It should be emphasized that the food patterns discussed here reduce the serum cholesterol level but do not equally affect the other lipid constituents. It would be rash indeed to suggest that the other constituents are of no concern from the point of view of atherogenesis. Clearly it remains to be shown that food patterns such as we propose are antiatherogenic. Our efforts have been to convert diets into food patterns so that any antiatherogenic value they have may be determined on large numbers of people. As long as individual diets had to be prescribed, there was little possibility of obtaining long-term experience from larger groups concerning a relationship between lowered blood cholesterol level and atherosclerosis. While further pilot studies must be made, it would appear that some tests on larger populations may even now be undertaken.

Summary

A food pattern has been devised which makes use of ordinary foodstuff, is easy to prepare, and is acceptable to many people. This pattern reduces serum cholesterol levels in normal and in many hypercholesteremic people. In some it is more effective than the low-fat diet. The key to the food pattern has been the use of a modified unsaturated vegetable oil in combination with foods low in saturated fats.

While our goal of ready availability and complete acceptance has yet to be achieved, the food pattern holds promise of relatively easy practicability. The food pattern is sufficiently developed to suggest its use in a broader test of the theory relating blood cholesterol levels with atherogenesis. There is much yet to be learned before we can recommend the present pattern as a proper modification of the American bill of fare, which chance and choice and custom have approved.

2020 E. 93rd St. (6) (Dr. Page).

This study was supported in part by a grant from the National Heart Institute, National Institutes of Health, Public Health Service, Bethesda, Md.

References

1. Symposium on Fats in Human Nutrition, Council on Foods and Nutrition, J. A. M. A. **164**:1890-1925 (Aug. 24) 1957. Page, I. H., and others: Atherosclerosis and Fat Content of Diet, Circulation **16**:163-178 (Aug.) 1957.

2. Kinsell, L. W., and others: Dietary Modification of Serum Cholesterol and Phospholipid Levels, Letters to the Editor, J. Clin. Endocrinol. **12**:909-913 (July) 1952. Ahrens, E. H., Jr.; Blankenhorn, D. H.; and Tsaltas, T. T.: Effect on Human Serum Lipids of Substituting Plant for Animal Fat in Diet, Proc. Soc. Exper. Biol. & Med. **86**:872-878 (Aug.-Sept.) 1954.

3. (*a*) Ahrens, E. H., Jr., and others: Influence of Dietary Fats on Serum-Lipid Levels in Man, Lancet **1**:943-953 (May 11) 1957. (*b*) Beveridge, J. M. R.; Connell, W. F.; and Mayer, G. A.: Dietary Factors Affecting Level of Plasma Cholesterol in Humans: Role of Fat, Canad. J. Biochem. & Physiol. **34**:441-455 (May) 1956.

4. (*a*) Bronte-Stewart, B.; Antonis, A.; Eales, L.; and Brock, J. F.: Effects of Feeding Different Fats on Serum-Cholesterol Level, Lancet **1**:521-527 (April 28) 1956. (*b*) Malmros, H., and Wigand, G.: Effect on Serum-Cholesterol of Diets Containing Different Fats, ibid. **2**:1-8 (July 6) 1957. (*c*) Gordon, H.; Lewis, B.; Eales, L.; and Brock, J. F.: Dietary Fat and Cholesterol Metabolism;; Fæcal Elimination of Bile Acids and Other Lipids, ibid. **2**:1299-1306 (Dec. 28) 1957. (*d*) Kinsell, L. W., and others: Effect of Vegetable Fat on Hypercholesterolemia and Hyperphospholipidemia: Observations on Diabetic and Nondiabetic Subjects Given Diets High in Vegetable Fat and Protein, Diabetes **3**:113-119 (March-April) 1954.

5. Perkins, R.; Wright, I. S.; and Gatje, B. W.: Effect of Safflower Oil Emulsion on Serum Cholesterol Levels in Young Adult Males: Its Use as Supplement to Normal Diet, J. A. M. A. **166**:2132-2135 (April 26) 1958.

6. Wilkinson, C. F., Jr.: Spaced Fat Feeding: Regime of Management for Familial Hyperlipemia, Ann. Int. Med. **45**:674-680 (Oct.) 1956.

7. McCann, M. B., and Trulson, M. F.: Our Changing Diet, J. Am. Dietet. A. **33**:358-365 (April) 1957. Food Consumption and Dietary Levels of Households in United States: Some Highlights from Household Food Consumption Survey, Spring, 1955, ARS 62-6 Agricultural Research Service, United States Department of Agriculture, Aug., 1957.

8. Anderson, J. T.; Keys, A.; and Grande, F.: Effects of Different Food Fats on Serum Cholesterol Concentration in Man, J. Nutrition **62**:421-444 (July) 1957. Reference 3*a*.

9. References 4*b* and 5.

10. Mattil, K. F.: Chemistry of Food Fats and Oils, Washington D.C., Institute of Shortening and Edible Oils, Inc., Aug., 1957. Animal and Vegetable Fats and Oils, 1956, United States Bureau of the Census, 1957.

11. Cheng, A. L. S.; Morehouse, M. G.; and Deuel, H. J., Jr.: Effect of Level of Dietary Calcium and Magnesium on Digestibility of Fatty Acids, Simple Triglycerides, and Some Natural and Hydrogenated Fats, J. Nutrition **37**:237-250 (Feb.) 1949.

12. Official Methods of Analysis of Association of Official Agricultural Chemists, ed. 8, Washington, D. C., 1955: (*a*) Method 15.110, p. 273; (*b*) Method 13.107, p. 229.

PHYSICAL CONDITIONING PROGRAM FOR ASTHMATIC CHILDREN

Merle S. Scherr, M.D.
and
Lawrence Frankel, Charleston, W. Va.

Asthmatic children often develop a pattern of suppression of physical exercise that deprives them of initiative and confidence. In order to break this pattern a program of physical activities was developed. The experience here described involved 25 children under active treatment for bronchial asthma. A remarkably broad range of activities was found possible, from basic breathing techniques and postural exercises to swimming and self-defense. Each child was encouraged to try to improve his own record rather than to compete with the other children. For some it was the first experience with physical exercises of any kind. Parents were usually excluded from the first few sessions with each child until the child was able to master each of the techniques presented to him. With proper attention to the bronchial asthma as allergy and with the cooperation of patient, parent, physician, and physical instructor, the results obtained were beneficial to the children both in combating the disease and in improving personality adjustment.

Supervised respiratory and physical exercises have been utilized for many years as a means of improving respiration in patients who have bronchial asthma. Since 1935 the literature has contained numerous articles concerning physical methods of attempting to relieve or improve bronchial asthma.[1] Most workers have concentrated on respiratory exercises alone, with a general physical exercise program being placed in the background. When the situation of repeated suppression of physical exercise occurs in asthmatic children, a lifetime pattern may be set up which may prevent the patient from participating in physical activities even when he is free from asthma. The combination of overprotection by parents and physical incapacity due to asthma can frequently lead to the asthmatic child being deprived of all physical activities. This may result in great mental suffering and loss of much initiative and confidence which aid in his personality adjustment to life.

In November, 1956, a program was started at the Charleston, W. Va., Young Men's Christian Association (YMCA) which combined the teaching of breathing exercises with physical conditioning exercises on a level which was designed for the individual child. The first group of participants in this program consisted of six boys who were suffering from moderate to severe asthma. The program consisted of exercises which were performed in game style. Each child was taught to compete with himself and not necessarily with the group. The respiratory exercises used were those outlined by the Asthma Research Council, London.[2] In addition to these respiratory exercises, the group was taught nonrespiratory gymnastics in a program, devised by us, which would not exhaust the child. These consisted of apparatus workouts with the Roman rings, horizontal bar, and medicine ball, climbing rope, swimming, tumbling, and similar gymnastics. An attempt was made to develop confidence in these asthmatic children by teaching combatives which included the basic skills of boxing, judo, and self-defense. The progress of each child was recorded for each activity.

In May, 1957, the program was enlarged in order to allow girls to participate in the activities. Total class size was limited to 25 children between the ages of 6 and 14 years. The program meets on two afternoons each week at the YMCA, and emphasis is placed on daily home practice of the activities. A total of 28 children have been enrolled in the program since its organization. It is felt that this program will enable the teaching of respiratory and physical exercises to be placed on a local level available to all asthmatic children by utilization of the YMCA type facilities as found in most cities of the United States.

Equipment and Personnel

The physical fitness director of the Charleston YMCA was employed to carry out the actual teaching in the program under the supervision of a trained allergist. The most essential part of the entire asthma conditioning program is the instructor. He must be well qualified for teaching and must have patience in dealing with asthmatic children. Furthermore, he must be taught the basic essentials concerning allergy, and asthma in particular, in order that he may appreciate the problems involved with these children. All children have previously received permission from their physicians to participate in the program and are under active treatment for bronchial asthma.

Chief, Allergy Clinic, Charleston Memorial Hospital (Dr. Scherr), and Research Associate, YMCA Asthma Conditioning Program (Mr. Frankel).

Nylon-covered, allergen-free mats, containing foam rubber as a filler, were used for all procedures which required a horizontal position and flat surface. With the exception of these special mats, regular YMCA facilities were used. The equipment required, most of which is usually found in a YMCA, consists of mats (foam rubber, plastic covered), horizontal bars, Roman rings, knotted nylon rope (about 26 ft.), unknotted nylon rope (about 26 ft.), medicine ball, basketball and baskets, boxing and wrestling rings, boxing gloves and protection equipment, stop watch, judo jackets (homemade), class uniforms, swimming pool, and other equipment as found useful for particular groups.

A uniform was adopted which consists of a judo jacket and white rubber-soled tennis shoes, shorts, and T-shirts. The children named themselves "Bucking Bronchos" (from bucking bronchial asthma), and the T-shirts obtained were so lettered, enabling each child to be identified with the group. This was felt to be important since the individual performance in a group activity was stressed. A stop watch was necessary in order to gauge the individual child's performance. The atmosphere surrounding the program is one of play and not one of medical treatment. The fact must be stressed if the child's interest is to be kept active. Music is utilized in performing many of the exercises. We have found that this creates more interest and lessens fatigue than if the exercises are performed as a "gym" activity.

Specific Methods

The program is divided into the following four broad phases: basic breathing techniques, postural exercises, gymnastics, and adaptation conditioning or confidence building activities (combatives).

Basic Breathing Techniques.—All basic breathing techniques are performed competitively in that the child competes with his own ability and not with the ability of his neighbor. Emphasis is placed on diaphragmatic breathing, costal breathing, and asymmetrical breathing. The general plan follows that which is recommended and outlined by the Asthma Research Council, London. Basic breathing exercises are to be done daily and when a patient feels the onset of an attack of asthma.

Abdominal or Stomach Breathing: While performing abdominal or stomach breathing exercises, the child lies on his back, with knees bent, feet on a bed or chair, arms to the side, and completely relaxed. One hand is then placed on the abdomen. He breathes out slowly through the mouth, making an "F" or "S" sound and making the hand sink into the abdomen. He breathes air in quietly through the nose, as abdominal muscles become relaxed and the hand comes up. Exhalation is timed with a stop watch, and weekly improvement is recorded as a gauge of progress. The upper part of the chest does not move. Expiration is long and inspiration is short. Exercises are done three times a day, 10 minutes at a time at first. Plenty of fresh air is desirable.

Diaphragmatic Assistance Breathing: In diaphragmatic assistance breathing the child lies on his back, with head and shoulders resting on a pillow, hands placed on lower ribs (thumb and fingers together), and knees bent. Shoulders are kept down and relaxed. The exercise consists of breathing out slowly through the mouth with the "S" sound, with a final squeeze at the end of this breath with the palms of the hands to insure emptying the lungs as much as possible.

Abdominal Muscle Exercise: In performing abdominal muscle exercises the child lies on his back, with knees bent, and feet on a bed or chair. Arms and shoulders are relaxed. The right knee is slowly brought to the chest while the child is breathing out, by tightening abdominal muscles. When he is ready to breathe in, he lowers the knee. The exercise is repeated with the left knee and with both knees together. Then, with the hands clasped behind his neck, the child sits up, brings the right elbow outside the left knee and then the left elbow outside the right knee (with feet held down in beginning). In performing the V-sit exercises the child sits on floor, with legs apart, and raises both feet 12 to 14 in. from the ground for 30 seconds, in good form.

Abdominal Breathing: In performing abdominal (or diaphragmatic) breathing exercises, the child sits in a chair with his back supported against the chair, completely relaxed. The hands are on the lower ribs and the child slowly breathes out with the "S" sound, tightening the abdominal muscles by making the abdomen go in, and pressing the last of the air out of the lungs as in diaphragmatic assistance breathing. The abdomen is relaxed as the child breathes in through the nose. (Note: The upper part of the chest should not be raised at any time.)

Forward Bending Exercise from Sitting Position: In doing the forward bending exercise the child sits with feet apart and arms relaxed at his side. He breathes out slowly with an "S" sound as he bends forward, first the head, then the shoulders, until the head is almost to the knees. Gradually he raises his head and straightens his back until the lower part of the back reaches the chair. (This is done on the "S" breath.) He breathes in as the middle part of the back, shoulders, neck, and head are straightened. In a sitting position, he breathes out quickly and then breathes in a short breath.

Forward Bending Exercise from Erect Position: In the forward bending exercise the arms are overhead, thumbs locked and arms in line with the ears. The abdominal and gluteal muscles are retracted, and the child bends in eight staccato counts until the fingertips touch the floor. He then returns to the starting position in eight staccato counts, with muscles contracted.

Postural Exercises.—Postural exercises are to be done between breathing exercises.

Elbow Circling Exercise: The elbow circling exercise is done while the child is sitting in a chair, leaning forward from the waist, keeping the back straight. Fingertips are rested on the shoulders; the elbow is bent and placed out to the side in line with the shoulders. The elbows are circled forward, up and back, and down. Four or five circles are made, and then the child relaxes.

Windmill Exercise: In doing the windmill exercise the child stands with feet slightly apart and arms to the side, halfway between the shoulders and hips. The arms are crossed in front. They are then raised, crossed in front of the face, and moved up over the head. Next they are spread apart and dropped to the side and to the starting position. *This is repeated 10 or 12 times, and then the child* rests.

Gymnastics.—Gymnastics are performed under supervision at all times. For rope climbing, two ropes are provided. One is knotted every 8 in., and the other is unknotted. The child is started on the 26-ft. knotted rope, and a rapid transition is made to the unknotted rope. This builds confidence and is usually accomplished in less than three weeks.

Tumbling and exercises with the horizontal bar and flying Roman rings are performed by the entire group on an individual basis. Calisthenic drill is performed by the group to a lively musical tempo. It has been found that phonograph music has increased interest and tolerance in the entire group and appears to lessen fatigue. We have made music an essential part of our basic program.

Medicine ball and basketball have been found to have an important place in the program, particularly since they are played in the usual school gymnasium. They aid in coordination and group adjustment. Swimming has become a part of the program, since it combines the use of all muscle groups with practical breathing functions.

Adaptation Conditioning, or Confidence Building Activities: Combatives.—Adaptation conditioning or confidence building activities enable the child to adapt to daily living. This course is grouped under the term combatives and is adapted only to the children in the group with kinesiological skills. Use of strength in a bullying manner is neither encouraged nor permitted. The principles are a composite of judo, wrestling, boxing, and La Savate. The children are taught graceful movement, proper body mechanics, and rapidity of action as the prime factors. All of these prime factors lead to the conservation of energy, which is an obvious necessity for the group of asthmatic children.

In lesson 1 of this course there is discussion and demonstration of balance and leverage, including breaking of grasps and holds, offensive and defensive postures, disturbing an opponent's balance in frontal and lateral planes, and take-downs from the erect position.

In lesson 2 are taught tricks of leverage using only hands and wrists, tricks from handshake, simple use of hammerlock, and use of breakfalls and roll outs (not formalized tumbling) in learning to fall without injury.

Lesson 3 concerns usage of elbows, knees, forearms, and ulnar border of hand for offense and defense. Included in this are releases from front and rear, such as front bearhug, choke from front, front hug (arms locked), strangle hold from rear, and body grasp from rear.

Lesson 4 concerns the technique of throwing, including the regular version of the hip throw, the sweeping hip throw, cross hock, and shoulder throw. Parries, including the outside parry, inside parry, cross parry, and scissors block, are taught at this lesson.

Lesson 5 concerns the use of the jacket in strangle defense, including the cross-arm technique, reaching carotid arteries, jolt choke, and hammerlock to forehead strangle.

Lesson 6 concerns simple nerve center defense applications.

Lesson 7 concerns foot techniques such as foot jab, knee and ankle trips, knee lift and knee drop, and other trips and counters.

The above procedures are demonstrated to the children and taught with the understanding that they are to be used for defense only. It is not the purpose of this class to produce "bullies" but rather to allow these children to learn basic techniques of defense against aggression. In addition to the above program, the children are taught a multiplicity of simple wrestling and boxing techniques which are adapted to the individual child's orientation to previous lesson plans. Each child is taught as an individual, and his circumstances are adapted to the lesson plans.

Results

The results of this preliminary report have not been subjected to statistical evaluation. All children but three in the program have been able to adjust well to a group activity which has been kept at the individual child's level. These three were replaced in the group in order to keep the enrollment at 25 children. Competition has been encouraged with the child's own record rather than the records of the other children. All of the children were able to participate in every activity. For many of the children in the program, this was the first experience with physical exercises of any kind. For some, it was the first really successful attempt at participation in group activities without dropping out because of their inability to participate due to bronchial asthma.

A successful attempt was made to utilize breathing exercises in an attempt to throw off the asthmatic attack in conjunction with medication. This made the child feel that he himself was actually aiding his own therapy instead of waiting for someone else to administer medicaments. In no case was the child made to feel that physical and respiratory exercises were the solution to his bronchial asthma problem. Emphasis was placed on his allergy management and the importance of his cooperation with his physician, parent, and physical program director. The idea of the child belonging to a "team" of physician, parent, physical program director, and patient created a greater desire for cooperation, since his results in the program were directly proportional to his cooperation as part of the team.

The three "failures" were all boys. One was deemed an intractable asthmatic and is now a patient in the Jewish National Home for Asthmatic Children, Denver. The other two were withdrawn by their parents, who resented the implications that their children had personality adjustment problems because of their environmental situation and disease. The other children in the group have demonstrated improvement as a result of participation in the asthma conditioning program by means of improvement and increase in school, home, and church activities, as well as a loss of fear concerning their asthmatic attacks. The frequency and severity of asthmatic attacks have been decreased in these patients as a group, and none of the children has required hospitalization for bronchial asthma since joining the group. In the year prior to joining the group, almost one half of the children had been hospitalized for moderate or severe bronchial asthma. Pulmonary function studies also revealed improvement. We will not attempt to enter into a full discussion of the many involved factors but will state that we feel this improvement is due primarily to enlightenment of the child and parents concerning bronchial asthma which resulted in better cooperation with the physician and treatment.

In addition, the improvement in the general physical condition of each child aided him to better cope with his disease. There was a definite emotional improvement in each child as demonstrated by his better adjustment to others in his daily activities. Many children were able to participate in such activities as summer camping, hikes, and school sports activities. One boy has become a star player on the champion "Little League" baseball team in Charleston. Prior to his enrollment in the asthma conditioning program, he was little interested in the sport. Other children have taken jobs as newsboys and as delivery boys, activities they would not previously have attempted because of lack of confidence in themselves. Others have gained the respect of their friends and classmates by no longer being the coward or weakling of the group. There are few "bullies" who will "pick on" a child who has a knowledge of judo, boxing, and wrestling, regardless of the child's handicap of active bronchial asthma. Each child in the group looks forward to the sessions of the asthma conditioning program with great eagerness. In addition, an achievement gold medal award is given at an annual party to each child for improvement over his own previous performance. This tends to give the child another incentive toward a goal of good health.

A familiar example of an asthmatic child is that of Theodore Roosevelt. The following quotation from a recent publication [3] reminds us that he, too, made use of a physical reconditioning program.

> But Theodore, as he grew older, was nontheless a boy sorely beset. "I was a sickly, delicate boy," he wrote, "and suffered much from asthma. One of my memories is . . . of sitting up in bed gasping, with my father and mother trying to help me." His arm muscles were so weak that he could not stand up to other youngsters. One day his father encouraged him: "You have the mind but not the body. . . . You must make your body. It is hard drudgery, but I know you will do it." Theodore organized a gymnasium with horizontal bars and a punching bag on the second floor of the town house and set about to do just that.

Comment

It is greatly appreciated that one of the most important results of asthma is the mental suffering and loss of initiative and confidence arising from the physical handicap. This is often a serious problem in the normal development of children. An asthmatic child may miss school and is frequently deprived of taking part in group activities with his schoolmates. Because of this and other factors, such as overprotection at home, he may suffer behavior and personality disorders. He may become unmanageable, irritable, and possibly dependent, or he may go to the other extreme and become aggressive, hostile, demanding, and bullying toward his parents and other children. He feels that he must compete with nonasthmatic children, and when he cannot successfully do this he becomes more of a problem in management. This YMCA program attempts to teach the patient to compete against himself rather than his nonasthmatic playmates. Each child who entered the program did so with a large amount of hostility and fear until it was demonstrated that he would have to compete only against himself.

Parents were excluded from the first few sessions with each child until the child was able to master each of the techniques presented to him. Only at this time were the parents allowed to attend the classes. This was done because it was demonstrated early in the program that the presence of the parents would distract the child from performing to the best of his ability. This decision was made after observation during the early sessions that the negative nodding of the parent's head or a cross look at the child would completely demoralize him and actually prevent him from even attempting to perform the activities. This is a partial, temporary form of the practice of "parentectomy" as advocated by the Jewish National Home for Asthmatic Children, Denver.[4]

Summary

A practical physical conditioning program for asthmatic children has been presented which may be adapted in any city with YMCA or equivalent facilities and a qualified physical instructor who is willing to learn the basic essentials concerning bronchial asthma. The program combines respiratory exercises, general physical exercises, and confidence building activities which aid the asthmatic child in combating his disease as well as improving his personality adjustment to individual and group activities and life in general. Emphasis is placed on cooperation between patient, parent, physician, and physical instructor as a team. Proper allergy management of bronchial asthma combined with a proper physical program designed for the individual child has given successful results in 25 asthmatic children.

803 Atlas Bldg. (Dr. Scherr).

The authors wish to express their appreciation to Mr. Myron Lewis, executive director, Mr. L. Warren Johnson, physical education director, and Mrs. Marjorie Tully of the Charleston YMCA and Miss Zelma Staats whose cooperation made this project possible.

This program has been supported in part by grants from Warner-Chilcott Laboratories, Division of Warner-Lambert Pharmaceutical Co., Morris Plains, N. J., and Center Laboratories, Port Washington, N. Y.

References

1. Schutz, K.: Respiratory and Physical Exercises, Wien. klin. Wchnschr. **48**:392 (March 29) 1935. Livingstone, J. L., and Gillespie, M.: Value of Breathing Exercises in Asthma, Lancet **2**:705-708 (Sept. 28) 1935. Baker, F.: Exercise in Treatment of Asthma, Arch. Phys. Med. **32**:30-33 (Jan.) 1951. Livingstone, J. L.: Physical Treatment in Asthma, Brit. J. Phys. Med. **15**:136-139 (June) 1952. Fein, B. T.; Cox, E. P.; and Green, L. H.: Respiratory and Physical Exercise in Treatment of Bronchial Asthma, Ann. Allergy **11**:275-287 (May-June) 1953. Fein, B. T., and Cox, E. P.: Technique of Respiratory and Physical Exercise in Treatment of Bronchial Asthma, Ann. Allergy **13**:377-384 (July-Aug.) 1955.

2. Asthma Research Council: Physical Exercises of Asthma, ed. 7, London, King's College, Strand, 1947, pp. 1-26.

3. Heroes: The Turning Point, National Affairs, Time **71**:16-24 (March) 1958.

4. Tuft, H.: Personal communication to the authors.

PERINEAL URETHRAL DIVERTICULUM—COMPLICATION OF REMOVAL OF ISCHIUM

A. Estin Comarr, M.D.
and
Ernest Bors, M.D., Long Beach, Calif.

Ischial decubitus ulcer is rather common among patients with spinal cord injuries, and it has been treated by the generally accepted method of removal of the ischium. This operation has been complicated by the development of a perineal urethral diverticulum, first observed and reported in four patients in 1955.[1] Since then, the number of cases has increased so much that it appears justified to emphasize this complication to the urologist, the plastic surgeon, and the general practitioner, who eventually take care of the patient once his specialized treatment at a spinal cord injury center is completed.

Removal of the ischium is the generally accepted method of treating ischial decubitus ulcer in patients with spinal cord injuries. Perineal urethral diverticulum has been observed in 22 of 48 patients after removal of the ischium (46%). It results from interference with the suspension of the triangular ligament and removal of the ischial tuberosities, thus exposing the pars diaphragmatica and the pars nuda urethrae to pressure. The diagnosis is made clinically (ischial sinus, perineal swelling, or ulcer), urethrocystographically, and urethroscopically. In the majority of cases treatment consists of introducing an indwelling catheter and of improving the general condition of the patient.

From the Spinal Cord Injury Service, Veterans Administration Hospital, Long Beach, and the Department of Surgery (Urology) of the School of Medicine of the College of Medical Evangelists and the University of California at Los Angeles.

Read before the Section on Urology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

Read in part by Dr. Comarr before the third annual Clinical Paraplegia Conference of the Veterans Administration, West Roxbury, Mass., 1954.

Methods, Material, and Results

Impressed by the severity of our first case, we now use urethrocystography routinely at regularly spaced intervals after every removal of the ischium. A maximum of 150 cc. of 10% methiodal (Skiodan) sodium solution is permitted to fill urethra and bladder by the gravity method; the penis is occluded and kept fixed to one side by the Cunningham clamp-skin clip-sandbag method [2]; anteroposterior exposures and right obliques are then taken. For urethroscopy we use a no. 24 panendoscope introduced under vision.

Two hundred nineteen patients with traumatic spinal cord lesions were examined at random, irrespective of the level and completeness of or the time-interval since injury. We found 171 patients for whom removal of the ischium had not been done who had no perineal diverticula. Of the 48 patients who had had this operation, 22 (45.8%) had diverticula; of 12 patients with unilateral removal of the ischium, 1 (8%) had a diverticulum, while of 36 patients with bilateral removal of the ischium, 21 (58%) showed diverticula of varying size and shape. The patient with diverticulum after unilateral removal of the ischium had an upper motor neuron lesion (spastic paralysis).

Eighteen of the 21 patients with diverticulum after bilateral removal of the ischium had lower motor neuron lesions (flaccid paralysis), 1 patient had an upper motor neuron lesion, and 2 had a combination of upper and lower motor neuron lesion with regard to the pelvic floor musculature. Of the 18 patients with lower motor neuron lesions, 14 had flaccid paralysis as a result of the injury, and 4 patients with originally spastic paralysis had flaccid paralysis after a subarachnoid alcohol injection (three cases) or an anterior rhizotomy (one case). The diverticulum in the patient with unilateral removal of the ischium was detected 5 months after operation, while the diverticula in the 21 patients with bilateral operation were found from 8 months to 11 years after the intervention.

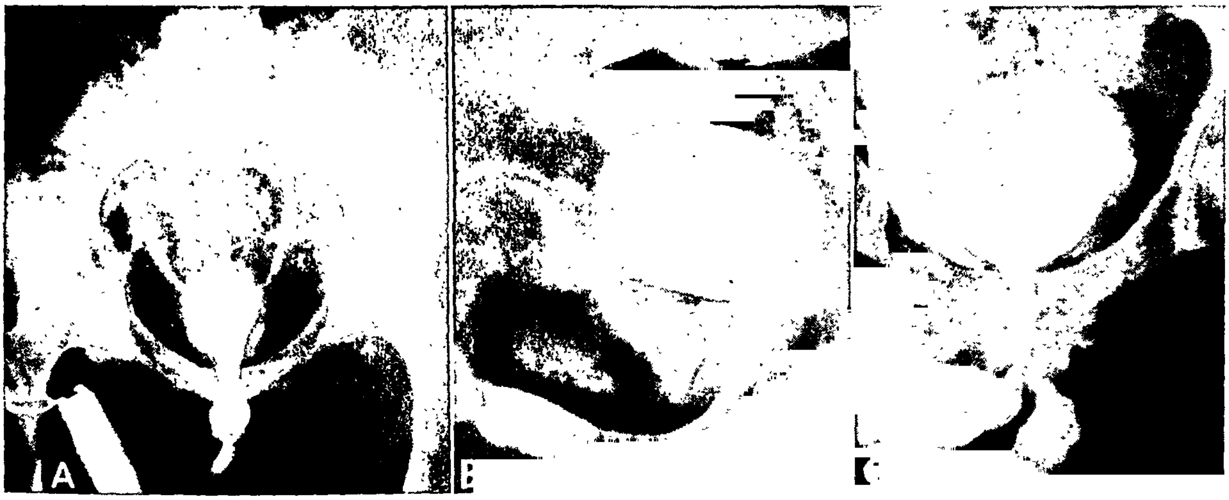


Fig. 1.—Segmentally complete lesions: *A*, at T-7 with spastic paralysis (bilateral removal of ischium). Note bilateral vesicoureteral reflux, bilateral prostatograms, and contracted bladder. Open vesical neck and symmetrically dilated diaphragmatic part, and possibly a relaxed pars nuda, cause solid uninterrupted outline of posterior and anterior urethra. Two small appendixes represent possible Cowper's glands. *B*, at T-8 with spastic paralysis (left unilateral removal if ischium). Oblique view simulates defect of right ischium due to overlying superior pubic ramus. Note penoscrotal diverticulum in addition to perineal diverticulum which includes diaphragmatic part and pars nuda. *C*, at T-11 with flaccid paralysis (bilateral one-stage removal of ischium). Note rectangular appearing deformity at level of pars diaphragmatica and secondary parasagittal diverticulum resulting from abscess (on the left). Pars prostatica outlined because of open vesical neck.

Comment

Urethrocystography as a routine method is preferable to simple urethrography in all patients with spinal cord injury generally, and in these patients particularly, for two reasons: 1. It is possible to detect other not-infrequent complications of the penoscrotal urethra, of the bladder wall, and of the vesicoureteral junction, e. g., reflux (fig. 1*A*). 2. It is an economical procedure which saves both financial expense and repeated exposure to radiation.

The pathogenesis becomes understandable if one considers the anatomy and roentgenologic anatomy of the perineal urethra, and the changes of tissue suspension and weight-bearing caused by surgery. The urethra can be differentiated roentgenologically and anatomically into four parts: a prostatic part, a diaphragmatic part (or membranaceous or fixed), a pars nuda, and an anterior mobile part.[3] Of interest here are the pars diaphragmatica and pars nuda. The former belongs to the posterior urethra; the latter, bordering directly on the pars diaphragmatica, is the hindmost part of the anterior mobile urethra; it is unprotected by muscles and, therefore, vulnerable to internal instrumentation as well as to external trauma. Its only protection in the sitting position is the hollow which is formed by the outjutting ischial tuberosities. The diaphragmatic urethra is originally well protected by the triangular ligament, which is composed of the l. transversum pelvis and l. arcuatum and represents the membranaceous part of the muscular pelvic diaphragm; it is suspended between the inferior pubic rami and is not dissimilar to an interosseous membrane.[4] By radical removal of the entire tuberosity of the ischium and trimming down to the utmost the inferior pubic ramus,[5] as is done in subperiosteal removal of the ischium, both mechanisms are severely disturbed; the protection of the pars nuda and the suspension of the diaphragmatic urethra.

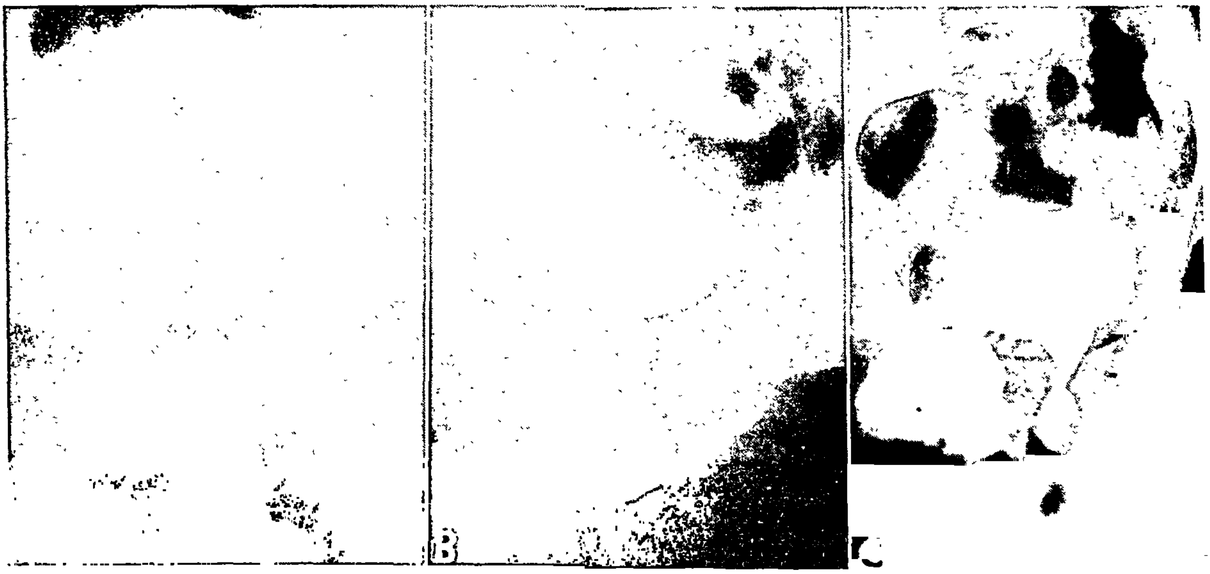


Fig. 2.—Segmentally complete lesions: *A*, at T-10 with flaccid paralysis (bilateral removal of ischium). Note large size of diverticulum extending to right and left and involving diaphragmatic and bulbous urethra in spite of closed vesical neck. *B*, at T-11 with flaccid paralysis (bilateral removal of ischium). Note left prostatogram in addition to perineal diverticulum, including pars diaphragmatica and pars nuda of urethra. Pars prostatica is outlined because of open vesical neck. Diverticulum includes proximal part of anterior urethra. *C*, at T-10 with flaccid paralysis (bilateral removal of ischium). Resection of diverticulum occupying space of ischial bone. Small neck connects sac with dilated, spindle-shaped, diaphragmatic urethra, demarcated by the M. compressor urethrae nudae (3) from anterior urethra. Urinary drainage from sinus in scar. Open vesical neck causes outline of prostatic urethra.

Thus this entire part is exposed to pressure and, therefore, to mucosal damage with all its consequences of periurethral extravasation, abscess, fistula, or diverticulum formation. The latter may extend laterally, ensconcing the bone stump of the resected inferior pubic ramus with subsequent osteitis and osteomyelitis; or it may develop parasagitally and anteriorly along the perineal raphe. Diversion of the urinary stream by suprapubic cystostomy, instituted immediately after injury, is no guarantee against the development of this complication. We have observed a median perineal ulcer corresponding to the site of the pars nuda urethrae in one patient of this series who had a permanent suprapubic cystostomy ever since injury and developed the ulcer many years after bilateral removal of the ischium.

The diagnosis is made clinically, roentgenologically, and urethroscopically. Clinically, there may be a sinus in the scar of the previous operative site with urinary or purulent drainage, as observed in our first two cases [1]; there may be a simple median perineal decubitus ulcer; or there may be a perineal, intermittently appearing swelling with escape of urine or hemorrhagic pus from the external urethral meatus on pressure. Roentgenographically, a wide, often bizarre variety of lesions is seen (fig. 1*B* and 2), which range from an apparently insignificant dilatation of the pars nuda and diaphragmatica of the urethra to huge unilateral or bilateral sacculations. Urethroscopically, again a variety of findings is present—from a small spindle-like dilatation to a diverticulum the neck of which may be wide enough to admit a no. 24 panendoscope. In advanced cases the remainders of the inferior pubic ramus can be seen to protrude as a whitish cottonlike mass. The differential diagnosis from other pathological changes of the urethra at the penoscrotal junction poses no problem.

In the last analysis, perineal diverticulum results from decubitus ulcer which, caused chiefly by neglect, is not infrequently multiple. Multiple ulcers are the main cause of amyloidosis.[6] Therefore, a Congo red test should be performed in all cases of diverticula with either endoscopically visible bone protrusion or a history of multiple decubitus ulcers.

BIOLOGICAL FALSE-POSITIVE RESULTS IN SEROLOGIC TESTS FOR SYPHILIS

FINDINGS IN A LOW SOCIOECONOMIC POPULATION GROUP

George W. Waring Jr., M. D., Alfred S. Lanes, M.D.
and
Herbert Mescon, M.D., Boston

Seventy-five patients with repeatedly positive standard serologic reactions for syphilis were given the Treponema pallidum immobilization (TPI) test. No included person had a history or physical findings suggesting infection, and no patients referred as having contact with syphilis or discovered to have an infected consort were accepted. Twenty-three of the series were Caucasian and varied widely in socioeconomic background. In 39% of these the results of the TPI test were negative and were classified as probable false-positive reactions. Fifty-two of the patients were Negroid and thought to be a relatively homogeneous social and economic group. All had positive reactions to the TPI test. This striking difference is consistent with the accepted epidemiology of syphilis. The authors emphasize the importance of the background and habits of patients in interpretation of the results of serologic tests for syphilis.

The 50th anniversary of the discovery of the Wassermann reaction was celebrated in 1956 with a restraint imposed by some uncertainty as to its reliability. Reservations about this procedure and its modifications are not new, for they were long ago classified as reagin tests. The term reagin indicates a seroreactive substance which may or may not be a true antibody, and the Wassermann reaction received this nondescript, poor-relation status years ago. Nevertheless, the test quickly proved its clinical usefulness and, somewhat paradoxically, acquired diagnostic authority nearly absolute in degree. For practical purposes, Wassermann reactivity has been viewed as synonymous with syphilitic infection. Physicians nevertheless have regularly encountered patients with persistently positive findings on reagin tests in whom syphilis seemed to some degree improbable, and the idea that some of these reactions are falsely positive gained gradual acceptance.

This concept, however, rested wholly on clinical opinion until the investigations of Nelson and Mayer,[1] which revealed in syphilitic serum an antibody independent of Wassermann-reactive substance. This has been made the basis of a diagnostic procedure called the Treponema pallidum immobilization (TPI) test, which has great value as a verification technique. More recently, complement-fixation reactions have been devised with use of extracts of treponemes, and they too detect antibody other than reagin.[2] Results of the treponemal tests are positive in a high percentage of patients with syphilis after the second or third month and rarely, if ever, show positive reactions in healthy persons free of any suspicion of infection. The specificity of these reactions is high, but the tests are technically difficult to perform and for a number of reasons will not detect 100% of cases of syphilis. This limitation is clearly demonstrated in a recent report[3] from a laboratory of excellent standards where the results of each test were negative in about 5% of serum samples positive to the other.

In 1952, Moore and Mohr[4] reported on 300 Caucasian patients, all of good economic status, from their private consulting practice. None of these had any evidence of syphilis except persistently positive standard tests. Forty-three per cent had negative findings on the TPI test and were regarded as false-positive reactors. This estimate has been affirmed by numerous others,[5] though the socio-epidemiologic background of the patients in later studies has been less clearly defined. At all events, the reliability of conventional serodiagnosis of syphilis has been vigorously challenged. The resulting enthusiasm for the diagnosis of the false-positive reaction has been certainly great—and probably excessive. Witness that, of 1,407 serums from patients with this diagnosis, submitted by physicians across the United States, 45% were found to be positive on treponemal tests.[3]

Since little published information has appeared dealing with the problem in social and racial elements in which syphilis is especially prevalent, a small-scale study of the question has been undertaken in the Genito-Infectious Disease Clinic of the Massachusetts Memorial Hospitals and the department of dermatology of the Boston University School of Medicine.

From the departments of dermatology and internal medicine, Boston University School of Medicine, and the Genito-Infectious Disease Clinic of the Massachusetts Memorial Hospitals.

Read before the Section on Dermatology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

Materials and Methods

In general, the Caucasian patients studied were those in whom the clinic physicians have felt the need for diagnostic verification. The Negro patients, on the other hand, were unselected.

Referrals to the clinic were largely from the epidemiologists of the Department of Public Health and from the ward and outpatient services of our own and a large municipal hospital. Documented reagin reactivity for at least three months was required for inclusion in the study. No patients referred as having contact with syphilis or discovered to have an infected consort were accepted. However, numerous cases or contacts of gonorrhea are included.

No included person had a history or physical findings suggestive of infection. The majority had spinal fluid examinations; findings in these were normal except in two persons, who had a slight protein level elevation.

Sixty-nine per cent of the group were Negro. Of incidental interest are the facts that 35% were at one time partners of broken marriages and several referrals were from correctional or penal agencies.

No effort was made to exclude patients with other chronic disease. One patient each with lupus erythematosus, sarcoid, hemochromatosis, gout, diabetes, and recently active tuberculosis was included in the series, and all had seemed to have syphilis except the patient with lupus erythematosus.

The study group comprises all but seven of those subjected to the TPI test. These were dropped chiefly because of inadequate serologic study to qualify as having real problems or because convincing clinical evidence of infection was discovered during observation.

Results

Immobilization tests have been obtained for us by Venereal Disease Division, Massachusetts Department of Public Health. Of the total series of 75 patients, 9 (12%) had negative findings. All of these probably false-positive reactions were in the Caucasian group, the selection of which has already been discussed. All of the 52 Negro patients had positive reactions.

Acknowledging the statistical limitations of this small study, it appears reasonable to suggest that the false-positive phenomenon occurs about one-fourth as often in the socioeconomic group which attends our clinic as in patients of more fortunate background and that it is quite rare in the Negro race.

Comment

Assuming that our Negro patients are persons of wide-ranging sexual activity within a group seeded with infection, this study becomes simply a demonstration of the epidemiology of syphilis, and as such it is presented. It underscores the importance of this kind of information in clinical diagnosis. Examination of the sexual partner(s) of a patient, as well as his children and often his parents, is a vital part of the diagnostic (and the public health) investigation. It is also important for the physician to develop an estimate of the patient's sexual habits. Pursued with tact and kindness, this matter is not always as futile as is sometimes supposed. To this circumstantial evidence should be added the spinal fluid findings and review of the patient's general medical status in search of clues to chronic disease known to cause false-positive reactions. It is well to include conventional hematological and urine studies and, perhaps, albumin and globulin measurement in the blood. Treponemal tests can then be interpreted against this background. It is easy to visualize situations in which results should be ignored if negative and are therefore superfluous. If positive, they are probably definitive.

Conclusions

The limitations of reagin tests are fully acknowledged. Fallibility of the treponemal tests, of a lesser order of magnitude, must be recognized. In our own study, by using epidemiologic preselection, we have assembled a group in which the margin of error of the reagin tests approaches zero, and we suggest that published rates approaching 50% result largely from the same factors applied in reverse. Our data are also a reminder of the importance of epidemiologic considerations in the diagnosis of syphilis. Finally, the clinician must collect and evaluate a variety of information, accepting the fact that not all problems and uncertainties can be resolved in the laboratory.

750 Harrison Ave. (18) (Dr. Waring).

References

1. Nelson, R. A., Jr., and Mayer, M. M.: Immobilization of Treponema Pallidum in Vitro by Antibody Produced in Syphilitic Infection, J. Exper. Med. **89:**369–393 (April) 1949.

2. Magnuson, H. J., and Portnoy, J.: Treponema Pallidum Complement-Fixation Test, Am. J. Pub. Health **46:**190-194 (Feb.) 1956.

3. Harris, A.; Falcone, V. H.; Price, L. S.; and Brown, W. J.: TPI and TPCF Tests on 2,000 Patients Difficult to Diagnose, Pub. Health Rep. **73:**210-214 (March) 1958.

4. Moore, J. E., and Mohr, C. F.: Biologically False Positive Serologic Tests for Syphilis: Type, Incidence, and Cause, J. A. M. A. **150:**467-473 (Oct. 4) 1952.

5. Miller, J. L., and others: Studies with Treponemal Immobilizing Test, J. A. M. A. **154:**1241-1247 (April 10) 1954. Boak, R. A., and others: Biologic False Positive Reactions for Syphilis in Pregnancy as Determined by Treponema Pallidum Immobilization Test, Surg. Gynec. & Obst. **101:**751-752 (Dec.) 1955. Ledbetter, R. K.: Treponema Pallidum Immobilization Test, Diagnostic Aid to Clinician, J. A. M. A. **160:**1392-1393 (April 21) 1956.

CLINICAL NOTES

COARCTATION REPAIR WITH RELIEF OF HYPERTENSION

REPORT OF A CASE IN A FIFTY-SEVEN-YEAR-OLD MAN

C. Frederick Kittle, M.D., James E. Crockett, M.D.
and
E. Grey Dimond, M.D., Kansas City, Kan.

Individually there is nothing unique about the age of 57 years, incapacitating hypertension, or coarctation of the aorta. However, the association of these three and relief of the latter two by a surgical procedure at an age when operation is not usually advised is sufficiently provocative to warrant detailed consideration.

Report of a Case

A 57-year-old man had been observed at the University of Kansas Medical Center since 1954, at which time he had been given a diagnosis of coarctation of the aorta. He had known of his hypertension since the age of 18 years. His complaints were of exertional dyspnea, fatigue, headaches, and vertigo and had been particularly severe since 1951. Angina occurred with exertion. In 1955, he had an episode of sudden headache, nausea, dizziness, and slurred speech which was diagnosed as a cerebral thrombosis. Coldness and exertional claudication of his legs had been present for many years.

For the three months prior to his admission in 1957, headaches and vertigo occurred daily to such an extent that he was forced to discontinue work and remain at bed rest. Inquiry revealed that he had had mumps at the age of 16 years with a secondary orchitis. He was married and had one daughter.

Physical examination showed a ruddy-faced adult with smooth features, a eunuchoid body, finely textured skin, and bilateral gynecomastia (fig. 1). Arm blood pressures were 190-210 mm. Hg systolic and 80-90 mm. Hg diastolic. Blood pressures could not be determined in the legs by auscultation. Examination of the eyegrounds showed an increased tortuosity of the retinal vessels with moderate arteriovenous compression. No hemorrhages, exudates, or papilledema were noted. Prominent pulsations were noted in the carotid and subclavian arteries, and collateral circulation could be palpated over the upper part of the chest. At the aortic area there was a grade 3 harsh systolic murmur with accentuation of the second aortic sound. There was a normal sinus rhythm. A systolic murmur could be heard over the interscapular area of the chest wall. The femoral artery pulsations were barely palpable, while the dorsal pedal and posterior tibial pulses could not be felt. The testes and external genitalia were smaller than usual, although the body hair was normal in distribution.

An electrocardiogram showed left ventricular hypertrophy and ischemia. Chest roentgenograms revealed an enlarged heart, particularly the left ventricle, and notching of the inferior surfaces of the third to eighth ribs bilaterally. The aortic knob was diminished. The 24-hour 17-ketosteroid excretion on two occasions was 7.2 mg. and 13.6 mg. (normal range 10-20 mg.).

In view of the patient's severe and increasing disability, operation was advised and done on Oct. 4, 1957. Endotracheally administered nitrous oxide-oxygen was used for anesthesia. Abundant collateral circulation was encountered in the chest wall, particularly in the subcutaneous and intermuscular areas. An "adult" type of coarctation was present distal to the left subclavian artery with marked poststenotic dilatation of the descending aorta. The aortic arch measured 22 mm. in diameter, the left subclavian 16 mm., and the dilated descending aorta 37 mm. An atherosclerotic plaque was noted along the medial side of the aorta proximal to the coarctation. In general, the aorta was quite elastic and supple in consideration of the patient's age. After mobilization of the vessels in this area, a segment of aorta 2 cm. long was excised. The internal orifice at the coarctation was 2 by 3 mm. (fig. 2). Direct end-to-end anastomosis could then be accomplished with use of a 0000 silk suture. An anastomosis measured at 25 mm. in diameter was obtained. During dissection about the coarctation and until the anastomosis was completed, trimethaphan (Arfonad) camphorsulfonate was administered intravenously to maintain a hypotension of approximately 60-90 mm. Hg systolic.

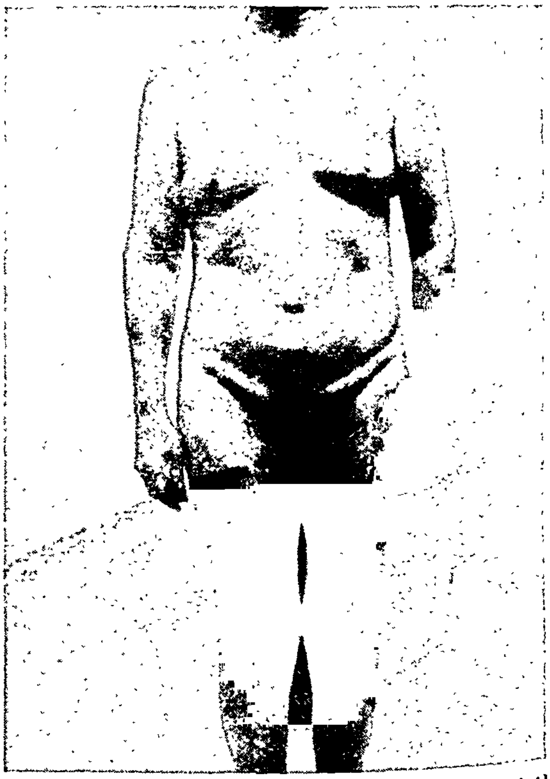


Fig. 1.—Patient with bilateral gynecomastia and eunuchoid stature.

Postoperatively, the blood pressure was normal; it has remained at normal levels subsequently, varying in a range of 120-150 mm. Hg systolic and 70-80 mm. Hg diastolic. A chest film taken two weeks postoperatively showed a marked decrease in heart size, and later films revealed a normal size and contour (fig. 3).

From the departments of surgery and medicine, University of Kansas Medical Center.

When seen two and again six months postoperatively, the patient stated that, since operation, no headaches or vertigo had occurred. Other cardiovascular symptoms were not present. Blood pressures in the arm were 140/80 and in the leg 190/110 mm. Hg.

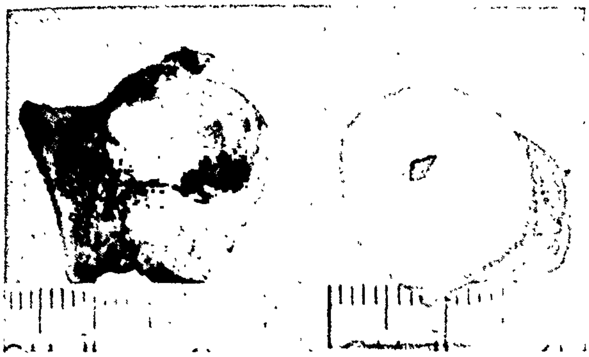


Fig. 2.—Resected segment of aorta containing coarctation.

Comment

Since the operative correction of coarctation was first accomplished in 1945,[1] many discussions regarding indications for treatment, and particularly regarding the age limits for this procedure, have occurred.[2] O'Sullivan and Glenn,[3] in discussing contraindications to the repair of coarctation, stated: "We have set no upper age limit for operation, but certainly a person in his forties presents an increased risk, a more difficult operation and a lesser likelihood of reversion to normality."

In consideration of this subject, the operative technical difficulties, as well as irreversibility of the hypertension in the older patient with coarctation, have been stressed. Thus, O'Sullivan and Glenn[3] mentioned a woman, aged 40, who underwent a successful operative procedure but whose hypertension persisted. Adequacy of the anastomosis was demonstrated by angiography. Clagett and Jampolis[4] told of exploration in a 50-year-old woman with coarctation in whom resection could not be completed for technical reasons. Similarly, Gross[5] described a 50-year-old patient whose coarctation was repaired with relief of hypertension but who postoperatively showed signs of spinal cord damage. Herron and co-workers[6] reported on a 49-year-old man with coarctation of the aorta and partial, probably secondary, Brown-Séquard syndrome. Operative correction of the coarctation in this patient was followed by relief of the hypertension.

The question of operability in the older age group is also compounded by such degenerative changes near the coarctated aortic segment as aneurysm formation and atheromatous and arteriosclerotic plaques. These constituted an important consideration to anastomosis prior to the availability of acceptable vascular prostheses. Since the introduction of satisfactory prostheses, the restoration of aortic continuity should no longer pose as prominent a problem technically.

The use of hypotensive anesthesia for brief operative periods has proved to be an important technical adjuvant for great vessel procedures, facilitating the mobilization of vessels near the coarctation as well as the actual anastomosis.[7]

The significance of this patient's eunuchoid appearance deserves comment and may explain, to some extent, the lack of degenerative changes in his vascular system. There have been suggestions that eunuchs do not develop arteriosclerosis as early to the same extent as individuals with normal androgenic function. However, this is still controversial,[8] and proof of decreased androgen in our particular patient, apart from his appearance, is lacking.

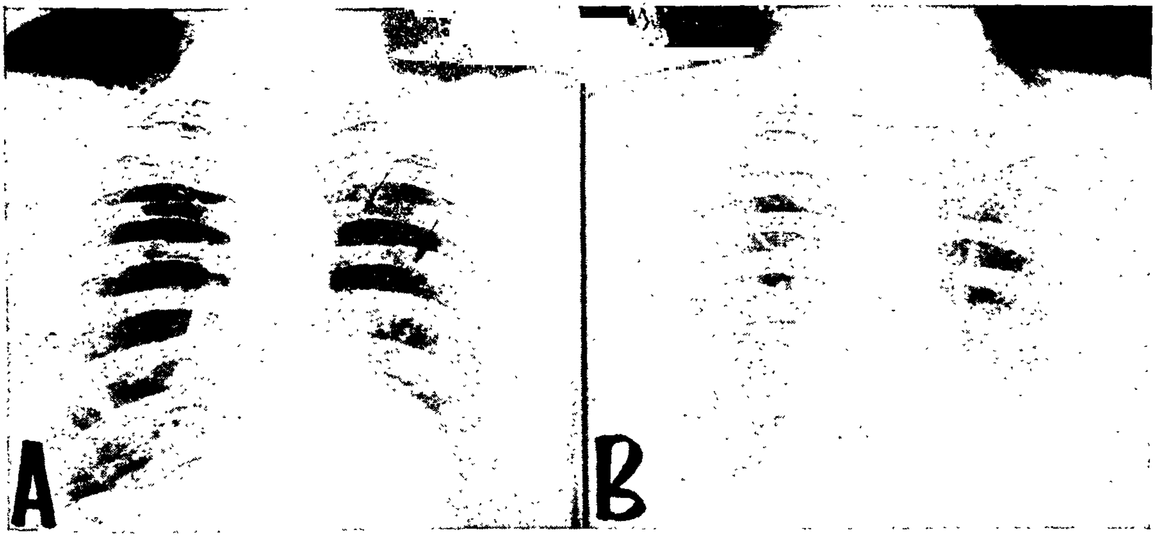


Fig. 3.—Roentgenogram of chest showing, *A*, preoperative cardiomegaly and rib notching (*arrows*) and *B*, postoperative diminution in heart size.

It is of particular interest in this patient to note that his hypertension, although present for 39 years preoperatively, was not fixed and irreversible but did revert to normal after excision of the coarctation and establishment of a satisfactory aortic lumen. As yet, no test has been devised to determine which patients will have unresponsive hypertension after coarctation repair, and the burden of proof must be with those who advise against operation in the presence of this anomaly.

Summary

A 57-year-old man with known hypertension for 39 years due to coarctation of the aorta was incapacitated by daily headaches, vertigo, angina, and dyspnea. Operative correction of the coarctation was done with prompt subsidence of his blood pressure to normotensive levels and complete relief of his symptoms.

Age, per se, should not be a contraindication to the operative correction of coarctation when symptoms are present. The availability of satisfactory vascular prostheses and use of hypotensive anesthesia are valuable adjuvants to facilitate management of the technical problems encountered with this anomaly.

University of Kansas Medical Center, Rainbow Boulevard at 39th Street (12) (Dr. Kittle).

References

1. Crafoord, C., and Nylin, G.: Congenital Coarctation of Aorta and Its Surgical Treatment, J. Thoracic Surg. **14**:347-361 (Oct.) 1945. Gross, R. E.: Surgical Correction for Coarctation of Aorta, Surgery **18**:673-678(Dec.) 1945. Gross, R. E., and Hufnagel, C. A.: Coarctation of Aorta: Experimental Studies Regarding Its Surgical Correction, New England J. Med. **233**:287-293 (Sept. 6) 1945.

2. Sealy, W. C.: Indications for Surgical Treatment of Coarctation of Aorta, Surg. Gynec. & Obst. **97**:301-306 (Sept.) 1953.

3. O'Sullivan, W. D., and Glenn, F.: Contraindications to Surgical Therapy of Coarctation of Aorta, Ann. Surg **142**:909-923 (Dec.) 1955.

4. Clagett, O. T., and Jampolis, R. W.: Coarctation of Aorta: Study of 70 Cases in Which Surgical Exploration Was Performed, A. M. A. Arch. Surg. **63**:337-348 (Sept.) 1951.

5. Gross, R. E.: Coarctation of Aorta, Circulation **7**:757-768 (May) 1953.

6. Herron, P. W., and others: Partial Brown-Séquard Syndrome Associated with Coarctation of Aorta: Review of Literature and Report of Surgically Treated Case, Am. Heart J. **55**:129-134 (Jan.) 1958.

7. Glenn, W. W. L.; Hampton, L. J.; and Goodyer, A. V. N.: Use of Controlled Hypotension in Large Blood Vessel Surgery, A. M. A. Arch. Surg. **68**:1-6 (Jan.) 1954.

8. Miller, F. R.: Personal communication to the authors. Furman, R. H., and others: Comparison of Serum Lipids, Lipoproteins, Glycoproteins, Urinary 17-Ketosteroids, and Gonadotropins in Eunuchs and Control Male Subjects, Circulation **17**:1076-1085 (June) 1958.

USE OF CITRATED CALCIUM CARBIMIDE IN ALCOHOLISM

Earl H. Mitchell, M.D., Washington, D. C.

Effective control of alcoholism by chemotherapy dates from 1943, when Asmussen and co-workers[1] and Jacobsen and Martensen-Larsen[2] first described the reaction of patients receiving disulfiram and alcohol. In 1951, Graham[3] demonstrated that disulfiram interferes with the metabolism of alcohol by inhibiting it at the acetaldehyde stage. Physical symptoms of the alcohol-disulfiram reaction (flushing, headache, tachycardia, and dyspnea) are believed to be due to the accumulation of acetaldehyde, and these symptoms are sufficiently unpleasant to serve as deterrents to further drinking. The value of disulfiram has been generally recognized, but its application has been limited by certain unpleasant side-effects, the most common of which are gastrointestinal disturbance, impaired taste, unpleasant breath and perspiration odors, lassitude, drowsiness, and diminished sexual potency.

In 1953, Fergusen[4] reported that citrated calcium carbimide (Temposil) in the presence of ingested alcohol produced an acetaldehyde reaction similar to that of disulfiram and alcohol. Either citrated calcium carbimide or disulfiram plus alcohol produced flushing of the face (mal rouge), tachycardia, dyspnea, fall in blood pressure, nausea, vomiting, and sleep lasting four to six hours. In their first report, Armstrong and Kerr[5] found that 19 patients experienced no side-effects from citrated calcium carbimide given daily up to four months. In a more recent report,[6] Armstrong stated that 29 patients were kept on therapy with this drug for as long as nine months without adverse symptomatology. Several of the patients did, however, manifest an elevated white blood cell count, a finding which is currently being explored. The 64 patients treated by Bell[7] responded favorably to therapy with this drug without the toxic side-effects encountered with disulfiram. It has been demonstrated by Smith and co-workers[8] that citrated calcium carbimide exerts its effect within 30 minutes and this effect lasts 8 to 12 hours after a single dose.

Methods

The clinical use of citrated calcium carbimide in the treatment of chronic alcoholism was explored. This drug was supplied for research purposes and is not yet available on the general market. Thirty-

---

From the Department of Psychiatry, Washington Medical Center.

eight patients were given 50 mg. of the drug daily for periods up to 11 months (27 of the group had previously received disulfiram). There were 12 women and 26 men. All were ambulant and 21 were employed. A detailed history was taken and a physical examination completed prior to treatment. Psychological testing was performed when indicated. An electrocardiogram, basal metabolic rate determination, hemogram, urinalysis, determinations of fasting blood sugar level, sulfobromophthalein retention, and cephalin flocculation, and a chest x-ray were included as part of the examination.

Coronary artery disease, arrhythmia, congestive failure, severe hepatic insufficiency, or latent psychosis were considered absolute contraindications to treatment. Patients with moderately impaired hepatic function and no jaundice (sulfobromophthalein retention of 15 to 20% and cephalin flocculation of 1+ to 3+) were given citrated calcium carbimide.

All patients had been unable to stop drinking even though they had previously tried several other methods of treatment. Each agreed to remain under medical supervision for a minimum period of six months and was asked to attend meetings of Alcoholics Anonymous. A supply of drug sufficient to carry the patient to the next office visit was given with instructions to take one tablet each morning. No patient was required to undergo alcohol conditioning, and each was instructed to discontinue medication for four or five days if the desire to drink could not be controlled. All were cautioned to avoid alcohol in cough syrup, elixirs, and mouth wash.

Since constructive attitudes at home were considered important, consultation with the family was included in preliminary discussion and follow-up visits. Family members were asked to attend Alanon Family Group meetings or family guidance clinic in order to understand and help the drinking member of their family.

Results

Of the 38 patients under study, 19 (50%) were treated for a total of 164 months; no relapse occurred, and they were considered to have obtained excellent results. Eleven patients (29%) with 15 relapses and 45 months of treatment were classified as attaining satisfactory results. During treatment they improved physically, lost fewer work days, and displayed increased insight. The remaining three patients (21%), with three or more relapses each and 34 months of total treatment, were unimproved. Their pattern of drinking and their physical and emotional status were unchanged by treatment.

Two patients experienced a mild acetaldehyde reaction after ingesting alcohol. Both recovered promptly without treatment. No serious side-effects or toxic reactions were observed, and there were no deaths in the group during the period of study. The sulfobromophthalein retention was increased in 4 (10%), decreased in 9 (24%), and unchanged in 25 (66%). Leukocyte count was unchanged in 19 (50%), decreased in 5 (19%), and increased in 15 (38%). Leukocytosis was present in the latter group, with an average count of 2,000 per cubic millimeter above normal. Differential count, hemoglobin level, and erythrocyte count remained normal in all patients. No accumulative effect, lassitude, drowsiness, diminished sexual potency, altered taste, or gastrointestinal symptoms were observed. Patients with medical complications due to excessive drinking received appropriate treatment in addition to the citrated calcium carbimide and in each case responded favorably.

Summary

Thirty-eight patients with chronic alcoholism were given 50 mg. of citrated calcium carbimide daily for periods up to 11 months, with favorable response in 30 (79%). No serious side-effects and no deaths occurred. Since relative leukocytosis and increased sulfobromophthalein retention was observed in some patients, laboratory and follow-up examination are necessary until the significance of these findings can be evaluated. No patient receiving citrated calcium carbimide experienced the side-effects associated with disulfiram. This drug is a useful adjunct to other measures in the treatment of alcoholism. It provides the alcoholic patient a period of enforced abstinence during which necessary insight and understanding may be developed.

2029 Que St. N. W. (9).

The citrated calcium carbimide used in this study was supplied as Temposil by Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.

References

1. Asmussen, E.; Hald, J.; Jacobsen, E.; and Jørgensen, G.: Studies on Effect of Tetraethylthiuramdisulphide (Antabuse) and Alcohol on Respiration and Circulation in Normal Human Subjects, Acta pharmacol. et toxicol. **4:**297-304 (Dec.) 1948.

2. Jacobsen, E., and Martensen-Larsen, O.: Treatment of Alcoholism with Tetraethylthiuram Disulfide (Antabus), J. A. M. A. **139:**918-922 (April 2) 1949.

3. Graham, W. D.: In Vitro Inhibition of Liver Aldehyde Dehydrogenase by Tetraethylthiuram Disulphide, J. Pharm. & Pharmacol. **3:**160-168 (March) 1951.

4. Fergusen, J. K. W.: New Drug for Alcoholism Treatment: New Drug for Treatment of Alcoholism, Canad. M. A. J. **74:**793-795 (May 15) 1956.

5. Armstrong, J. D., and Kerr, H. T.: New Drug for Alcoholism Treatment: New Protective Drug in Treatment of Alcoholism (Preliminary Clinical Trial of Citrated Calcium Carbimide), Canad. M. A. J. **74:**795-797 (May 15) 1956.

6. Armstrong, J. D.: Protective Drugs in Treatment of Alcoholism, Canad. M. A. J. **77:**228-232 (Aug. 1) 1957.

7. Bell, R. G.: New Drug for Alcoholism Treatment: Clinical Trial of Citrated Calcium Carbimide, Canad. M. A. J. **74:**797-798 (May 15) 1956.

8. Smith, J. A.; Wolford, J. A.; Weber, M.; and McLean, D.: Use of Citrated Calcium Carbimide (Temposil) in Treatment of Chronic Alcoholism, J. A. M. A. **165:**2181-2183 (Dec. 28) 1957.

EVALUATION OF RANDOM BLOOD GLUCOSE LEVELS AMONG AMBULANT WOMEN

Dorothy Macy Jr., M.D., Mary E. Frank, M.D.
and
Frieda Baumann, M.D., Philadelphia

In the course of the annual diabetes detection drives from 1948 through 1956 at the Woman's Medical College of Pennsylvania, we accumulated 1,068 random blood glucose determinations, on 936 women, by the Folin-Wu method. Duplications represent different years or rechecks of questionably abnormal values; if the rechecks confirmed the presence of diabetes, only the original value was included in the series to be presented here. Ages ranged from 3 months to 79 years; 739 persons were under 40. Three hundred twelve were 5 lb. (2.3 kg.) or more overweight; 307 gave a positive family history of diabetes. There was no preparatory period of high carbohydrate intake and no standard pretest meal. The types of food taken and the time of the last meal or snack were noted. All individuals were ambulant; the degree of activity between the last feeding and venipuncture varied.

These random blood glucose levels were arranged in frequency distributions from the lowest to the highest blood glucose level at seven time intervals: fasting, one-half, one, one and one-half, two, two and one-half, and three hours after food intake. Determinations done more than three hours after eating were classified as fasting levels.

Analysis of Determinations

All seven frequency distributions were skewed to the right. One blood glucose determination was 51 mg. % at one hour; recheck was normal. This is the only value in the range of 50-59 mg. % that occurred in a series that since has totaled 1,685 cases, and we question its accuracy. If it is ignored, the lower level of the range of blood glucose values among these women becomes 65 mg. %. Since the Folin-Wu method includes 19-31 mg. % of non-glucose-reducing substances in the blood, 65 mg. % by this method represents 34-46 mg. % of true blood glucose. The reason for the relative fixation of the lower limit becomes clear: a blood glucose level persistently below this level is incompatible with human life. It is also apparent that if the frequency distributions were not skewed to the right one should suspect that a sampling error had occurred, since comparable degrees of hyperglycemia are entirely compatible with human life.

For each of the seven frequency distribution the following points were located: the nadir (lo point), the mode, the median, the arithmetic mean and the levels at or below which findings in 90, 95 96, 97, 98, and 99% of the population fell. The latte are percentile points. The mode is the value aroun which the items tend to concentrate; because it i the most typical value, it is the most descripti average. These points have been plotted on a grap (see figure) whose ordinate is blood glucose in mil ligrams per cubic centimeter and abscissa is time i minutes, and corresponding percentile points a different times have been joined by continuou curves. The nadir, mode, and what we have label the "96th percentile curve" are represented by soli lines. From the 90th to the 96th percentiles th curves show two peaks, which might be calle primary and secondary peaks, and three relati low points: fasting, two hours, and three hou after intake of food. The 97th percentile cur lacks the two-hour low point. The 98th percentil curve shows a peak in place of the two-hour lo point and a rising tendency in place of the thre hour low point. In brief, for this particular population a change in the general contour of the upp percentile curves begins at the 97th percentile an is further accentuated above it.

Comment

The purpose of this presentation is to show th range of blood glucose levels which occurred i the population which was studied and the percen age of the population which fell within any give limits. Blood glucose homeostasis is a dynamic stat it is an open system, constantly receiving materi from and releasing material to its environment, b it is a system which has boundaries. The boundaries are determined by the fact that, when the limits of such a steady state are exceeded, the stat disappears—in this instance the state disappea when the capacity to return spontaneously towa the median is lost (irreversible hypoglycemia, fulminating hyperglycemia). These limits are not absolutes; the level of blood glucose at any give moment is the net result of multiple simultaneo variables, some of which are interdependent, an whose effects may be positive or negative; th limits are functions of the variables. Among apparently normal individuals one encounters isolated

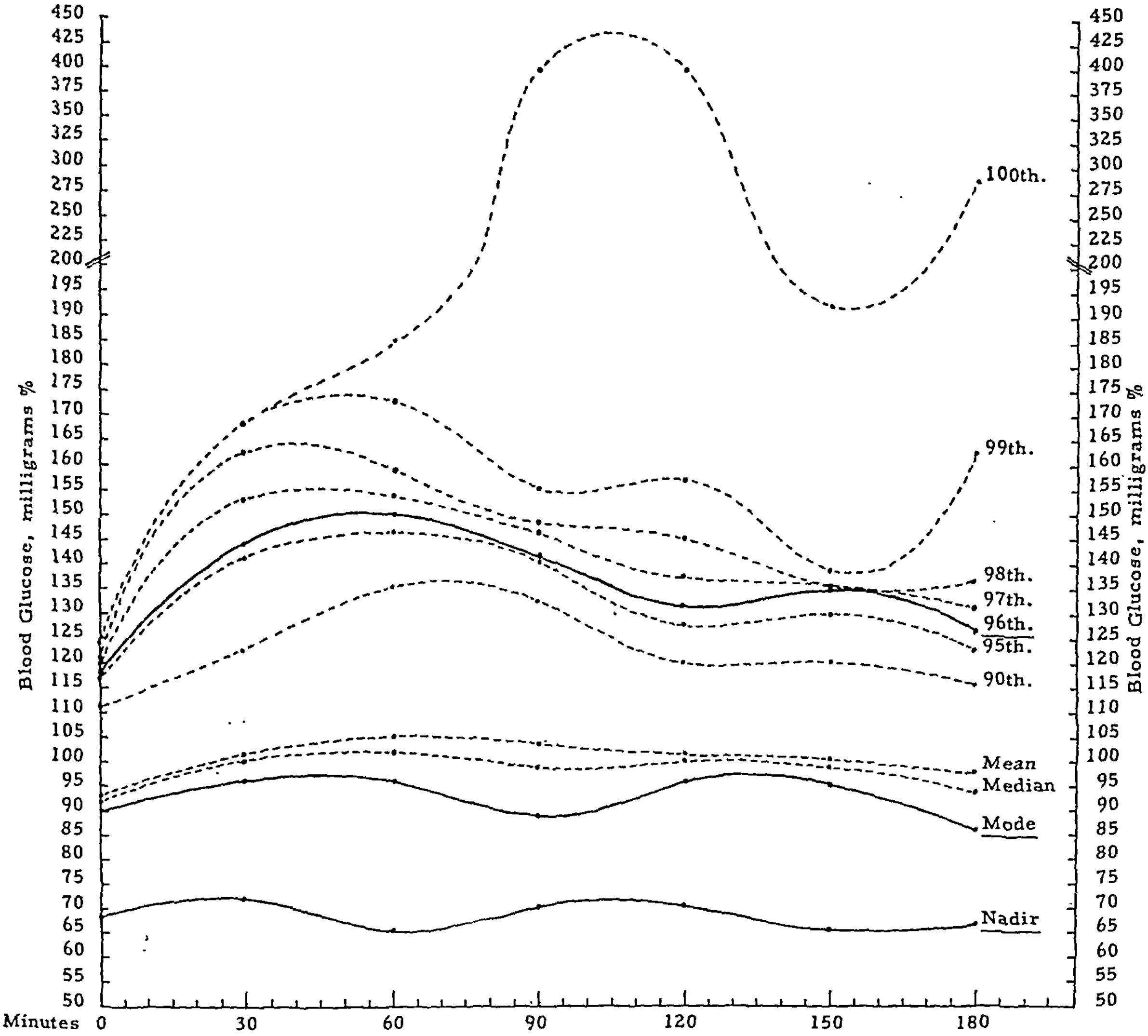
---

From the Department of Medicine, Woman's Medical College of Pennsylvania.

Read, in part, before the Section of Physiology, Federation of American Societies for Experimental Biology, Philadelphia, April 17, 1958.

even occasional elevations of blood glucose to levels which usually connote diabetes; among diabetics, there are those who neither take insulin nor follow any dietary regimen yet under many conditions have blood glucose levels within the accepted "normal" range. Under fasting conditions, when the glucose load is minimal, there is a marked overlap among blood glucose levels of diabetic and nondiabetic individuals.

Observation of all possible combinations of variables would be necessary to determine the boundaries of an open system. This is impractical, and



	Fasting	1/2 Hour	1 Hour	1 1/2 Hours	2 Hours	2 1/2 Hours	3 Hours
Total Cases	165	87	139	144	350	97	86
Nadir	68	72	65	70	70	65	67
Mode	90	96	96	89	96	95	86
Median	92	100	102	99	100	99	94
Mean	93	102	105	104	102	101	98
Percentiles							
90th.	111	123	135	133	120	120	116
95th.	117	141	147	141	128	130	123
96th.	118	144	150	142	132	135	127
97th.	120	153	154	147	137	136	132
98th.	121	163	159	149	145	136	137
99th.	124	168	173	155	157	139	163
100th.	124	168	185	400	400	193	289

Curves of nadirs, modes, medians, and certain percentiles from 1,068 random determinations of blood glucose levels (Folin-Wu method, with venous blood of ambulant women).

one can only approximate those boundaries by making a definite number of observations on spontaneously occurring combinations of variables. This approximation to the boundaries of blood glucose homeostasis is a crude estimate of the probability of the maintenance of the steady state. The mode, in turn, is an approximation to the most typical level of blood glucose, toward which the system tends no matter what the variables.

Returning to the figure, it can be seen that the blood glucose levels represented in the 97th and 98th percentiles fall in a range not uncommonly seen among untreated persons with mild diabetes in the absence of complications. Of the population screened, 3.9% had blood glucose levels above the 96th percentile curve, the highest percentile to conform with the 90th, an upper percentile which reflects normality since we know that less than 10% of the population is diabetic. The incidence of diabetes among the population as a whole in the United States has been estimated to be about 2%. The population represented in the figure was exclusively female, one-third over 40 years of age, one-third overweight, and one-third with a positive family history of diabetes—all situations in which diabetes is more common—so that an incidence of 3.9% in such a group is not utterly improbable. The correlation between clinically established facts and the range in which atypical contours appear in the percentile curves suggest that the region of these changing contours marks the usual range of the upper limit of blood glucose homeostasis for the particular population screened, i. e., ambulant women. It must be emphasized that if one were screening a different population—overweight women only, thin women only, or some other group—the region of changing contours of upper percentile curves would not necessarily be identical. In fact, where physiological differences which influence carbohydrate metabolism exist between two groups, the contours of the percentile curves would necessarily be different; when the components of the system are changed, the conditions for homeostasis are changed. If the combinations of variables which are included in the system under observation have been limited, the result is to define a limited portion within the general steady state. The identification of the zone between normal and abnormal depends on the contours of the curves in relation to time, which reveals whether the system is tending to maintain itself.

If this reasoning is valid, we have in the data presented here a useful empirical criterion for the specific situation of random blood glucose levels among ambulant women and, in addition, a general method for the evaluation of certain types of steady states in biology. Confirmation or refutation of the validity of the method rests on further empirical observation.

Summary

Blood glucose levels were determined by the Folin-Wu method on 1,068 blood specimens drawn from an apparently well female population which ranged in age from 3 months to 79 years. Samples were obtained in the fasting state and up to three hours after intake of food. There was no preparatory period of high carbohydrate intake and no standard pretest meal. Results were arranged in frequency distributions at 30-minute intervals. The nadir, mode, median, and mean and the 90th, 95th, 96th, 97th, 98th, and 99th percentile points were located for each group; corresponding points at the different time intervals were joined by continuous curves. The curves represent blood glucose levels as these actually occur among ambulant women under usual conditions. It is suggested that the range between the nadir and the 96th percentile curve represents the range of blood glucose homeostasis under these conditions and that the 97th percentile and above represents diabetes mellitus. It is shown that there is a level of blood glucose toward which the system tends no matter what the variables (such as food and exercise).

This method of evaluating random blood glucose levels yields an approximation to the boundaries of blood glucose homeostasis for the particular population observed. It is a method for estimating the probability of the maintenance of the steady state and, hence, a potentially useful method for the study of such states. The validity of the method can be determined only by further observation.

705 Beechwood Rd., Media, Pa. (Dr. Macy).

GLAUCOMA.—Although there has been long recognized danger of glaucoma in patients being treated with the usual belladonna-like drugs, the neurologic literature is empty of such reports in the treatment of Parkinsonism. In a random sample of Parkinson patients studied by means of recording intraocular tension, only one minimally abnormal value was obtained and no patient experienced any subjective symptoms suggestive of glaucoma. It would appear that the predisposition to glaucoma in the individual patient is of far more importance than the mere use of a parasympatholytic anti-Parkinson drug. If the neurologist takes a careful initial and follow-up history, the danger of his patients with Parkinson's disease or syndrome developing glaucoma is quite small.—C. F. Edwards, M.D., and D. S. O'Doherty, M.D., Anti-Parkinson Drugs and Their Relationship to Glaucoma, *Bulletin Georgetown University Medical Center,* September, 1958.

CHRONIC RECURRING SPONTANEOUS PNEUMOTHORAX DUE TO ENDOMETRIOSIS OF THE DIAPHRAGM

Elmer R. Maurer, M.D., James A. Schaal, M.D.
and
F. L. Mendez Jr., M.D., Cincinnati

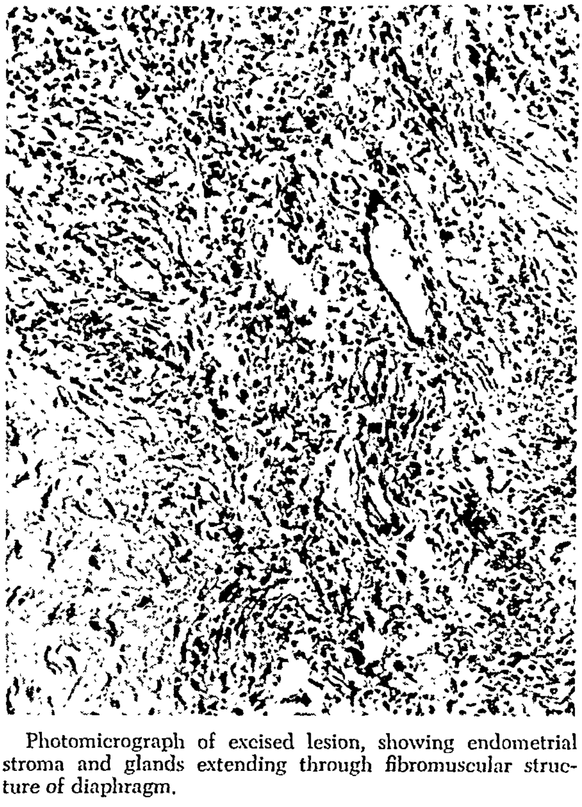
Chronic recurring spontaneous pneumothorax is a relatively common disorder which usually results from rupture of subpleural blebs. Endometriosis of the diaphragm, on the other hand, is an exceedingly rare lesion and, as nearly as can be determined, has never been reported in association with, or as a cause of, unilateral recurring pneumothorax.

The following case report is presented because of the extreme rarity of the lesion involved and the unusual association of pneumothorax with the menstrual cycle. It is the first recorded instance of successful surgical treatment of chronic recurring pneumothorax by excision of a defect in the diaphragm that has resulted from endometriosis.

Report of a Case

A 35-year-old woman was first seen in consultation on March 13, 1953, because of pain and dyspnea resulting from a spontaneous pneumothorax on the right side. The patient had had two previous spontaneous pneumothoraces on the right, the first having occurred on Nov. 14, 1952. Findings on the general physical examination were negative except for distant breath sounds over the upper right part of the chest and hyperresonance of the percussion note due to a pneumothorax. Roentgenograms of the chest revealed a very minimal pneumothorax (15%) over the extreme apex and the base of the right lung. No emphysematous blebs were apparent in any portion of either lung. Because of the small quantity of air in the chest and the absence of serious symptoms, removal of the air by thoracentesis or tube thoracostomy was not thought to be indicated. The patient was discharged from the hospital for follow-up care by her attending physician. She was again seen in consultation on March 20, 1954, approximately one year after the original examination, because of 12 new episodes of recurrent pneumothorax on the right side. All pneumothoraces were associated with pain and mild dyspnea and had been verified by roentgenographic examination of the chest. For the first time, the patient volunteered the information that all 15 episodes of spontaneous pneumothorax had come during the period of menstruation. The important clinical significance of this observation was not appreciated at the time. Because of the chronicity of the lesion, open thoracotomy with possible talc poudrage and excision of any blebs that may not have been apparent on roentgenographic examination was recommended.

Right thoracotomy on March 31, 1954, revealed a persistent moderate pneumothorax on the right side. Careful examination of all lobes of the right lung revealed no evidence of blebs. Testing of the lung with positive pressure, while saline solution was dripped over the surface, disclosed no points of air-leak. The lung parenchyma grossly presented a normal appearance and consistency. The most remarkable finding involved the right diaphragm. Near the point of emergence of the inferior vena cava and extending radially and laterally in the central portion of the right leaf of the diaphragm was a circumscribed, oval-shaped area of attenuation which measured 4 by 3 cm. in diameter. Numerous purplish-red nodulations were apparent on this surface. In the central portion of the diseased area in the diaphragm was an aperture 2 cm. in diameter. This communicated freely with the peritoneal cavity. The area of disease in the diaphragm, along with the defect, was widely and completely excised. The consequent diaphragmatic opening was repaired with interrupted mattress sutures of cotton, size 0. Examination of the specimen showed that the disease had involved the complete thickness of the diaphragm. Final inspection of the superior surface of the diaphragm revealed a solitary purplish-red nodule, 1 cm. in diameter, which obviously represented a supradiaphragmatic endometrial implant. This also was completely excised. Following reexpansion of the lung and the placement of an intrapleural catheter for water seal drainage, the chest wall was closed in layers. The postoperative diagnosis was endometriosis of the right leaf of the diaphragm resulting in perforation and implant of endometrial nodules on the intrathoracic surface of the diaphragm. Microscopic examination of the surgical specimen showed extensive involvement of the fibromuscular stroma of the diaphragm by nests of endometrial stroma and glands (see figure). The single nodule on the supradiaphragmatic surface was composed of endometrial tissue.



Photomicrograph of excised lesion, showing endometrial stroma and glands extending through fibromuscular structure of diaphragm.

The postoperative course of the patient was entirely uneventful, and she was discharged from the hospital on her ninth postoperative day, being afebrile and ambulant, and with her right lung completely expanded.

Because of pain in the pelvis and dysmenorrhea, the patient was seen by a gynecologic consultant. Bimanual examination revealed adherence of the fundus and nodules throughout the adnexa. A diagnosis of pelvic endometriosis was made, and on Aug. 18, 1955, total hysterectomy with bilateral salpingo-oophorectomy was performed. The patient's postoperative recovery was again uneventful. In the four and one-half years after the thoracotomy, the patient has had no recurrent chest symptoms or pneumothorax.

Comment

Aberrant endometrial islands have been reported in many locations, including the ovaries, uterine ligaments, rectovaginal septum, sigmoid colon, urinary bladder, umbilicus, laparotomy scars, hernia sacs, appendix, vagina, vulva, cervix, lymph glands, and small intestine, and in bizarre locations, such as the upper and lower extremities, lungs, and pleura.[1] Sampson's [2] original theory of transtubal regurgitation of menstrual blood and endometrial particles, published in his original paper in 1921, could certainly explain the method of implantation of endometrial growths on the pelvic and intra-abdominal viscera, as well as on the inferior aspects of either leaf of the diaphragm. The lymphatic and hematogenous dissemination theory of Halban would be necessary to explain distant endometrial implants in the thigh, lung, and pleura.[1a] Distant spread without passing through the pulmonary capillaries could occur only by way of the vertebral veins or "lung shunts" which have apparently been demonstrated between the pulmonary arteries and veins bypassing the lung capillaries.

In view of the concomitant finding of pelvic endometriosis and the involvement of all layers of the right leaf of the diaphragm, with perforation and supradiaphragmatic seeding demonstrated by thoracotomy, in the present case report, it would seem logical to conclude that the endometrial involvement of the diaphragm must of necessity have occurred as the result of transtubal regurgitation and transperitoneal dissemination. Exact explanation of the method of development of the pneumothorax on the right side is more difficult. However, the clinical observation that all episodes of pneumothorax occurred only during the time of menstruation, and the inability to demonstrate any source of lung leak or primary disorder in the lung which could explain any possible leakage of air into the pleural cavity, would suggest that the recurrent pneumothoraces in the case reported here were the result of erosion and perforation of the right diaphragmatic leaf by endometrial implant and the passage of air from the uterus by way of the fallopian tubes into the peritoneal cavity and then by way of the opening in the diaphragm into the pleural cavity, with consequent pneumothorax. Although we are unable to find any reports of spontaneous pneumoperitoneum occurring during the menstrual cycle, the practical possibility of this is suggested by the free anatomic communication between the cavity of the uterus with the peritoneal space by way of the fallopian tubes. Practical application of this knowledge is regularly used in the so-called Rubin test for patency of the tubes. During this procedure, carbon dioxide is passed into the uterus and then by way of the tubes into the peritoneal cavity. During the test, patients may experience shoulder pain and present roentgenographic evidence of pneumoperitoneum.

Summary

Chronic recurring pneumothoraces resulting from erosion of the diaphragm by endometrial implants during periods of menstruation occurred in a young woman. This was surgically corrected by excision of the involved portion of the diaphragm. The unanticipated findings encountered at operation in this patient present an additional indication for exploratory thoracotomy in all cases of unexplained, constantly recurring, spontaneous pneumothorax.

827 Union Central Bldg. (Dr. Maurer).

References

1. (*a*) Novak, E., and Novak, E. R.: Textbook of Gynecology, ed. 5, Baltimore, Williams & Wilkins Co., 1956, p. 546. (*b*) Nunn, L. L.: Endometrioma of Thigh, Northwest Med. **48:**474-475 (July) 1949. (*c*) Hartz, P. H.: Occurrence of Decidua-Like Tissue in Lung: Report of Case, Am. J. Clin. Path. **26:**48-51 (Jan.) 1956. (*d*) Hobbs, J. E., and Bortnick, A. R.: Endometriosis of Lungs: Experimental and Clinical Study, Am. J. Obst. & Gynec. **4:**832-843 (Nov.) 1940. (*e*) Nicholson, H.: Endometriosis of Pleura, Thorax **6:**75-81 (March) 1951.

2. Sampson, J. A.: Perforating Hemorrhagic (Chocolate) Cysts of Ovary, Arch. Surg. **3:**245-323 (Sept.) 1921.

THE FUNCTION OF THE BRAIN.—Any biological view of the function of the brain leads us to an unavoidable conclusion: consciousness is not unique to man, to the primates, or to the mammals: it goes back to the roots of vertebrate history and has been progressively elaborated in content, coloring and complexity roughly in proportion to the evolution of the neuromuscular system. It cannot even be argued that consciousness is a unique vertebrate invention—the crab, the octopus, the butterfly, the ant, all possess sensory devices imparting to them the awareness of their world; all demonstrably engage in integrated time-binding, self-serving action, and it must be presumed that all participate in some proportional measures in conscious awareness of themselves and their environment.—H. W. Smith, The Philosophic Limitations of Physiology, Perspectives in Physiology, Washington, D. C., American Physiological Society, 1954.

COUNCIL ON FOODS AND NUTRITION

Report to the Council

The Council has authorized publication of the following report. This article is part of a nutrition education program which is assisted by the Nutrition Foundation, Inc.

PHILIP L. WHITE, Sc.D., *Secretary.*

HEREDITARY GALACTOSE DISEASE

George M. Guest, M.D., Cincinnati

Galactosemia and galactosuria characterize a hereditary disease caused by an inborn error of metabolism, which produces in an affected child the inability to metabolize galactose and lactose normally. Some appropriate terms that have been suggested and used synonymously are galactose diabetes, essential galactosuria, congenital galactosemia, congenital galactosuria, galactosis, and galactemia.[1] The term used here, galactose disease, is favored by Kalckar and his associates[2] who have recently done outstanding work on the fundamental etiology of the disorder.

Cases of this disease were first described in Germany by von Reuss[3] in 1908 and by Göppert[4] in 1917, and first in the United States by Mason and Turner[5] in 1935. In 1946, Goldbloom and Brickman[1a] counted only seven previously reported cases when reporting two more. Since then, reports have appeared with increasing frequency; it now seems obvious that the disease is much more common than is generally believed. It is characterized by multiple manifestations, of varying severity, all presenting challenges to the biochemist, pathologist, clinician, and dietitian. The great importance of early recognition of galactosuria lies in the fact that deleterious effects of the disorder increase with its duration and that appropriate treatment (omission of milk from the diet) usually leads to prompt diminution or total disappearance of its various abnormal manifestations and to a good prognosis.

Clinical Signs and Symptoms

The main symptoms of the disease appear early, usually when the infant is one or two weeks old; in 90% of reported cases they were recognized within the first year of the infant's life. Jaundice, persisting far beyond the usual period of so-called physiological jaundice of the newborn infant, may constitute an early sign that more serious trouble is impending. Neonatal bleeding has been reported as an early complication.[6] This might conceivably result from liver damage, with lowered prothrombin and fibrinogen levels in the blood, but these factors seem to have been little studied. Goldbloom and Brickman[1a] reported low values for serum globulin in two infants. The course can be fulminant, with rapid development of hepatomegaly, splenomegaly, and ascites. Hyperchloremic acidosis has been observed, with low serum potassium level.[7] Death may occur within a few weeks or months.

On the other hand, the course may be slow, as in the child reported by Ritter and Cannon,[8] in whom the cataracts and other features of the disease were not recognized clinically until she was five years old. The history of the slower course usually includes a report of slow growth or growth failure, feeding difficulties characterized by refusal of food, regurgitation, or vomiting, and sometimes diarrhea with yellow stools. Cataracts usually develop within the first year and have been reported as early as the 13th day of life. Mental retardation becomes apparent with increasing age of the untreated infant. Hypochromic anemia, reported by some investigators, may be a secondary result of feeding difficulties that can aggravate the tendencies to develop iron deficiency existing even in normal infants during the first and second years. Urinalysis reveals varying degrees of melituria, albuminuria, and aminoaciduria.

Heredity

Although it is generally accepted that galactose disease is determined genetically, its exact mode of transmission is not yet clearly defined. A positive or suggestive history of the disease among direct or collateral relatives has been elicited in about 30% of the reported cases. In several instances, the disease has occurred in more than one sibling in a family. There is no evidence of sex linkage. In one pair of parents consanguinity was reported.

Holzel and Komrower[9] searched for evidence of the trait in seemingly unaffected persons by performing galactose tolerance tests among parents and relatives of galactosemic infants in five families. Reduced tolerance for galactose as revealed by this test was found in at least one parent of each child with clinical galactosemia and in both parents in one instance. Three of six siblings, free of recog-

---

From the Children's Hospital Research Foundation and the Department of Pediatrics, University of Cincinnati College of Medicine.

nizable signs of the disease, showed abnormal galactose tolerance curves. It seemed, therefore, that heterozygous carriers of the trait, who had no clinically notable manifestations, could be detected by their abnormal responses to the galactose tolerance test. These observations were interpreted to indicate that inheritance of galactose disease is recessive, the overt form of the disease being manifested in individuals who are homozygous, with regard to the abnormal gene. An uncertainty of this argument lay in the fact that abnormal tolerance was not demonstrable in both parents of all children with the overt disease; but, as the authors point out, probably the test is not sufficiently sensitive to demonstrate an incomplete metabolic block. Holzel and Komrower[9] suggest that this trait is much more common than was originally believed and that the gene is likely to become more widespread with improved treatment of the overt manifestations of the disease and with increasing survival of homozygous babies.

The galactose tolerance test has, of course, long been used as an index of liver function in both acute and chronic liver disease. Hartmann and co-workers[6] reported cases of transient galactosemia and galactose intolerance occurring in young infants associated with diarrheal disease, malnutrition, and immaturity. Although the intolerance was regarded as a complication of the associated diseases, the possibility of a partial metabolic block of true galactose disease must be considered in the light of Holzel and Komrower's concept of the heterozygous carrier with minimal physical manifestations of galactose disease. In such cases the associated diseases, acute or chronic, might conceivably act to aggravate an existing mild intolerance of galactose, genetically determined. Against this possibility Hartmann points out that the galactose tolerance curves of these infants became normal after recovery from their acute diseases.[10] This fact, however, would not necessarily exclude the existence of a partial metabolic block.[10]

Pathology

In patients with active clinical manifestations of galactosemia, anatomic changes are most prominent in the liver, kidneys, and the lens. The liver shows areas of cellular degeneration and necrosis, with bile stasis, abnormal pseudoacinar grouping of the hepatic cells, sometimes with fatty metamorphosis.[11] If the patient survives long enough, two types of cirrhosis may develop: the micronodular Laënnec's type and cirrhosis associated with postnecrotic scarring.[12] The kidneys may show swelling of the tubular epithelium, with the cells containing what is often described as glycogen but which some investigators have suggested might be galactogen. B. H. Landing[13] states, however, that, in some tissue sections which he examined, the material did not have the staining characteristics of galactogen. Cataracts in the lens may display either lamellar or central nuclear opacities.[1a]

The cause of the cellular changes is by no means clear. Evidence of direct toxic effects of galactose has been adduced from Dam's[14] experiments in which feeding of a high-galactose diet to chicks led to damage of the central nervous system; evidence is also available from experiments on rats, in which feeding high-lactose rations led to the development of cataracts.[15] The latest and most plausible suggestion is that cellular damage is not caused by the galactose per se but by the cellular accumulation of galactose-1-phosphate, which has been found to inhibit several enzyme systems.

No obvious histological signs of cellular damage in the brain have been described to account for the commonly observed mental retardation.[16] Evidence of brain damage is limited to functional observations, but, because the disease varies so much in its severity in different individuals, such evidence is difficult to interpret. Speculating on the nature of the impairment of central nervous system function that leads to mental retardation in galactosemic children, Mason and Turner[5] suggested that the hypoglucosemia which is often found with hypergalactosemia might lead to cellular damage, especially in the brain. The fact that other types of hypoglycemia, acute and chronic, do not produce this kind of clinical picture makes this hypothesis doubtful.[17]

The mentally deficient galactosemic child does not present neurological symptoms like those that develop after severe hypoglycemia (such as changes in the electroencephalogram). It is true that reciprocal changes in concentration of glucose and galactose in the blood occur during a galactose tolerance test and after a mixed meal containing milk. This shift may be a result of competition between galactose and glucose both in the intestinal mucosa during simultaneous absorption of the two sugars and in the enzyme systems of liver and other tissue, but the concomitant effects and consequences are not clear.

It has been suggested that defective utilization of galactose may interfere with the synthesis of galactolipids, cerebrosides that are involved in the rapid myelinization which normally occurs in the first few weeks or months of life. Some investigators suggest that complete exclusion of galactose from the diet as part of treatment might have later deleterious effects, making the children more susceptible to demyelinating disease. Against this possibility, Holzel and associates[7] pointed out that the galactose required for synthesis of cerebrosides can be derived in situ from glucose by reactions in which the intermediation only of uridinediphosphogalactose (UDP galactose) and galacto-waldenase (later named UDP Gal-4-epimerase) is needed; these enzymes are available in the galactosemic child.

There is abundant evidence that, if therapy is begun early, the severe physical manifestations of the disease may be prevented, or reversed if already developed, especially with regard to liver damage and cataracts, but the complete prevention of mental retardation is less certain. In several reported cases in which treatment began early, the mental development of affected children is said to be normal.

Biochemical Pattern and Diagnostic Procedures

If the infant is taking a milk diet, a reducing substance is invariably to be found in the urine, although not necessarily in every specimen. It is important to note that, when meliuria is observed in a young infant, the diagnosis of galactosuria should be considered before that of diabetes mellitus, the incidence of the former being at least four or five times more frequent.

For the differential diagnosis of melituria, the recently available glucose oxidase methods have great practical value in excluding glucosuria. The specific enzyme, glucose oxidase, has been incorporated in indicator papers. These were offered primarily for qualitative tests for glucose in urine in diabetic management; but aside from that use, the test is applicable for quick differential diagnosis of other types of melituria. When dipped in urine, these test papers turn blue in the presence of glucose but remain unchanged if glucose is not present. The test is negative with all reducing sugars other than glucose. In several instances, when infants were sent to the Cincinnati Children's Hospital with a tentative diagnosis of diabetes mellitus, because so-called sugar had been found in the urine, the receiving physician, by means of this simple test, was able quickly to exclude the diagnosis of diabetes; on the basis of history and physical findings, the tentative diagnosis was changed in the admitting room to galactosuria or to fructosuria (the latter associated with evidence of acute hepatitis), diagnoses that were later confirmed by chromatographic methods.

For identification of reducing substances in the urine, the fermentation tests with yeast, much used in the past, may yield presumptive evidence that the sugar is not glucose or fructose, i. e., most likely galactose, but it must be remembered that some yeasts do ferment galactose. Relatively simple techniques for paper chromatographic methods for the identification of sugars and amino acids in the urine have been described by Bickel and Hickmans,[1c] Hsia and associates,[18] and Lockhart and Roboz.[19]

Aminoaciduria is an important feature of the pattern of biochemical disturbances that accompany galactosuria.[20] When galactosemic children are receiving a milk diet and showing galactosuria, the excretion of amino acids is greatly increased. It is generally said to be due to diminished tubular resorption of amino acids resulting from renal irritation by the excreted galactose.[20a] The increased excretion is general, including all the amino acids usually found in the urine of normal infants. In a few cases studied in Cincinnati, the hydroxyamino acids, serine and threonine especially, appeared to be disproportionately increased. That aminoaciduria may be slow to develop after galactosuria is demonstrable, but it is also slow to disappear after galactose is eliminated from the diet and galactosuria has ceased. The concentration of amino acids in the blood appears not to be increased above normal.

Hsia and associates[18] and Holzel and associates[20b] reported studies of aminoaciduria in galactosemic children, first in a seemingly normal state after a long period on a galactose-free diet and then after galactose was added to the diet. Before this test, the amino acid excretion was similar to that of normal children, but, after galactose was added to the diet, the amino acid excretion increased twofold to fivefold. This returned to normal again after administration of galactose had been discontinued for 10 days. In Cincinnati we have made similar observations. Hsia found the increased aminoaciduria to be generalized, without any single amino acid being excessively prominent. Speculations on the biochemical mechanisms that are involved have dealt with questions of competition between enzyme systems and of toxic effects of galactose and its intermediate products of metabolism on various tissue cells but without definitive conclusions. The fact that several of the essential amino acids were excreted in considerable quantities may have a bearing on the manifestations of nutritional deficiency that develop in this disease when it is uncontrolled, but the quantitative importance of such losses is not defined.

A most important recent development in this field is the discovery that the inability to metabolize galactose in congenital galactosemia is due to the absence in liver and blood cells (probably in all tissues) of a single specific enzyme, which is normally involved in the conversion of galactose to glucose. Normally, galactose is metabolized by phosphorylation to galactose-1-phosphate by galactokinase and adenosinetriphosphate; the galactose-1-phosphate is, in turn, converted to glucose-1-phosphate by reactions that involve a nucleotide, uridine-glucose-diphosphate, and two specific enzymes, galactose-1-phosphate uridyl transferase and galacto-waldenase. Earlier, Schwarz[21] and coworkers in England reported that galactosemic red blood cells, when incubated with galactose, accumulated galactose-1-phosphate, whereas normal red blood cells did not. Subsequent work at the National Institutes of Health revealed that the accumulation of galactose-1-phosphate in the galactosemia cells was due to absence in the cells of the specific enzyme, galactose-1-phosphate uridyl transferase.[22] Thus, it appears that "the gene or genes responsible for galactosemia control the synthesis of P-galactose-uridyl transferase in the cells."[7]

These studies led to the development of a specific diagnostic test for congenital galactosemia.[23] This test can be done satisfactorily on the erythocytes of newborn infants, even from cord blood,[22a] thus affording a feasible procedure for earliest possible diagnosis of galactose disease when the family history suggests that it might be expected in the new offspring. Kirckman and Kalckar have now modified the test in such a way that it can be used for the detection of so-called traits. They found that parents (usually both) of galactosemic children have a markedly lowered activity of galactose-1-phosphate uridyl transferase in the red blood cells.

Effects of Treatment

When galactose is eliminated from the diet of a galactosemic infant, the level of galactose in the blood falls quickly, proteinuria ceases, and the level of amino acids in the urine decreases to amounts found in the urine of normal infants. After this, the infant gains weight, hepatomegaly gradually diminishes, jaundice disappears slowly or quickly, and opacities of the lens, if present, gradually clear. After such apparently complete recovery, resumption of milk feeding even for a short period may provoke a return of all symptoms, with vomiting, albuminuria, and aminoaciduria, that again disappear when milk is withheld. With increasing age of the child, the galactose tolerance test shows a persistent abnormality, although the child may become progressively less sensitive to breaks in the dietary regimen. Among different individuals, incomplete enzyme deficiency or availability of alternate pathways of galactose metabolism may account for differences in the clinical picture. With increasing age of the child, the functional maturity of organ systems that are injured by the cellular accumulation of galactose-1-phosphate also may account for changes in sensitivity to galactose.

The need for early diagnosis and treatment of galactosemia cannot be overemphasized. There is abundant reason to believe that the danger of damage to the central nervous system in this disease is greatest during the first few weeks or months of the infant's life, the period of most rapid growth and development of the brain. Here the importance of early treatment is comparable to that of certain other metabolic diseases that are known to be associated with mental retardation in children, e. g., cretinism and phenylketonuria.

With regard to cretinism, it is well known that the earliest possible administration of thyroid extract to the athyroid infant favors both physical and mental growth and development, whereas later treatment may promote improved physical development but with less or no effect on mental retardation. In phenylketonuria, rapidly accumulating evidence currently indicates that the administration of phenylalanine-restricted diets to the phenylketonuric infant at an early age, preferably under 2 months and before the appearance of any signs or symptoms of abnormality, may allow normal mental and neurological development.[24] However, if the restricted diet is started when the child is older than 3 years and if signs of mental retardation and convulsions are fully developed, there is little or no objective evidence that the diet is beneficial.

In phenylketonuria, as in galactose disease, the mechanisms responsible for central nervous system damage are not yet clearly defined. It has been claimed that brain damage may occur as a result of secondary deficiencies of essential amino acids or other food elements or as a result of neurotoxic agents formed as products of the intermediary metabolism of phenylalanine. It appears that after about 3 years of age the infants who were successfully treated with the phenylalanine-restricted diet can be fed a normal unrestricted diet without risk of further brain damage. Armstrong notes the probability that the extent of early damage influences the effect of the deleterious metabolites, as indicated by the fact that older, untreated phenylketonurics with milder biochemical abnormalities can be mentally normal. Such reasoning may equally apply to galactosemic infants who are treated early and develop normally, and to those who are treated late and exhibit evidences of more or less severe mental retardation which persists, despite a galactose-restricted diet.

Treatment

Treatment is directed toward rigid exclusion of galactose from the diet by withholding milk, especially human milk with its high galactose content. For young infants, liquid formulas may be made up with casein hydrolysate preparations such as Nutramigen. Numerous investigators have reported good results after the use of soy-bean products (such as Mul-Soy or Sobee) as a milk substitute, but Holzel and co-workers point out that soy beans contain stachyose, which is a tetrasaccharide with two molecules of galactose; theoretically, therefore, these preparations should be avoided, but no one has yet measured just how much galactose is liberated from the stachyose during digestion.[25] Holzel claims that some sensitive infants may fail to thrive and may suffer continued brain damage when the diet contains only a trace of galactose, insufficient to show in the blood and urine.

When solid foods are added to the diet, care must be taken not to include foods prepared with milk or those that have lactose added. Acceptable foods are cereals (offered, of course, without milk), vegetables, eggs, fruits, meats, gelatin puddings (made without milk), and bread or crackers (if made without milk). Goldbloom recommended washed milk curds resuspended in Ringer's solution, sweetened with corn sirup. It should be noted that cheese and milk curds may contain around 1% of galactose, and butter may have 0.2% of galactose. Vitamin C tablets and other medicinal tablets are often made up with lactose, and some commercially prepared cereals contain lactose, added during the manufacturing process. The diet should be supplemented with sufficient amounts of vitamins to supply the quantities recommended for normal infants; calcium, either as chloride or gluconate, should be added to supplement the low-calcium content of the milk-free diet and fruit juices to augment the potassium intake.[26] Holzel and associates recommend Moll's pudding, prepared of cereal, sugars, eggs, margarine, and cane sugar.[25a]

Summary

Early diagnosis and treatment of hereditary galactose disease is of the greatest importance since the deleterious effects of this disorder increase with its duration. The main symptoms usually appear by the time the infant is one or two weeks of age, making early recognition possible. Appropriate treatment is primarily the omission of milk and other foods containing galactose from the diet. Early therapy may prevent or reverse the severe physical manifestations of this disease, and it is likely, although not certain, that mental retardation may be completely prevented.

Indicator papers for differential diagnosis of meliturias are available as Testape from Eli Lilly & Company and as Clinstix from the Ames Company, Inc.

Reagents for enzymatic test for the specific diagnosis of congenital galactosemia are available from the Sigma Chemical Co.

Aided by a grant from the U. S. Public Health Service, National Institutes of Health.

References

1. (*a*) Goldbloom, A., and Brickman, H. F.: Galactemia, J. Pediat. **28:**674-691 (June) 1946. (*b*) Bray, P. T.; Isaac, R. J.; and Watkins, A. G.: Galactosaemia, Arch. Dis. Childhood **27:**341-347 (Aug.) 1952. (*c*) Bickel, H., and Hickmans, E. M.: Paper Chromatographic Investigations on Urine of Patients R. T. and R. R., ibid. **27:**348-350 (Aug.) 1952.

2. Kalckar, H. M., and Maxwell, E. S.: Biosynthesis and Metabolic Function of Uridine Diphosphoglucose in Mammalian Organisms and Its Relevance to Certain Inborn Errors, Physiol. Rev. **38:**77-90 (Jan.) 1958.

3. von Reuss, A.; Zuckerausscheidung im Säuglingsalter, Wien. med. Wchnschr. **58:**799-803, 1908.

4. Göppert, F.: Galaktosurine nach Milchzuckergabe bei angeborenem, familiärem, chronischem Leberleiden, Berl. klin. Wchnschr. **54:**473-477, 1917.

5. Mason, H. H., and Turner, M. E.: Chronic Galactemia: Report of Case with Studies on Carbohydrates, Am. J. Dis. Child. **50:**359-374 (Aug.) 1935.

6. Hartmann, A. F.; McCoy, E. E.; Swarm, P. A.; and Nakasato, D. I.: Further Observations on Metabolism of Galactose in Infants and Children, J. Pediat. **44:**499-507 (May) 1954.

7. Holzel, A.; Komrower, G. M.; and Schwarz, V.: Galactosemia, Am. J. Med. **22:**703-711 (May) 1957.

8. Ritter, J. A., and Cannon, E. J.: Galactosemia with Cataracts: Report of Case with Notes on Physiopathology, New England J. Med. **252:**747-752 (May 5) 1955.

9. Holzel, A., and Komrower, G. M.: Study of Genetics of Galactosemia, Arch. Dis. Childhood **30:**155-159 (April) 1955.

10. Hartmann, A. F.: Personal communication to the author.

11. Bell, L. S.; Blair, W. C.; Lindsay, S.; and Watson, S. J.: Galactose Diabetes (Galactosemia): Clinicopathologic Study of 2 Siblings, J. Pediat. **36:**427-439 (April) 1950. Reference 1*a*.

12. Townsend, E. H., Jr.; Mason, H. H.; and Strong, P. S.: Galactosemia and Its Relation to Laënnec's Cirrhosis: Review of Literature and Presentation of 6 Additional Cases, Pediatrics **7:**760-773 (June) 1951.

13. Landing, B. H.: Personal communication to the author.

14. Dam, H.: Galactose-Poisoning in Chicks, Proc. Soc. Exper. Biol. & Med. **55:**57-59 (Jan.) 1944.

15. Mitchell, H. S., and Dodge, W. M.: Cataract in Rats Fed on High Lactose Rations, J. Nutrition **9:**37-49 (Jan.) 1935. Craig, J. M., and Maddock, C. E.: Observations on Nature of Galactose Toxicity in Rats, A.M.A. Arch. Path. **55:**118-130 (Feb.) 1953.

16. Clay, P. R., and Potter, C. T.: Case of Galactosemia with Special Reference to Mental Development, Arch. Dis. Childhood **30:**147-149 (April) 1955.

17. Bruck, E., and Rapoport, S.: Galactosemia in Infant with Cataracts: Clinical Observations and Carbohydrate Studies, Am. J. Dis. Child. **70:**267-276 (Nov.-Dec.) 1945.

18. Hsia, D. Y. Y., and others: Amino-Aciduria in Galactosemia, A.M.A. Am. J. Dis. Child. **88:**458-465 (Oct.) 1954.

19. Lockhart, J. D., and Roboz, E.: Case of Galactosemia Identified in 4 Day Old Infant by Paper Chromatographic Technic, Pediatrics **13:**211-216 (March) 1954.

20. (*a*) Snyderman, S. E.: Metabolism of Amino Acid: Review, Pediatrics **21:**117-142 (Jan.) 1958. (*b*) Holzel, A.; Komrower, G. M.; and Wilson, V. K.: Amino-Aciduria in Galactosaemia, Brit. M. J. **1:**194-195 (Jan. 26) 1952. (*c*) Bickel, H., and Thursby-Pelham, D. C.: Hyperamino-Aciduria in Lignac-Fanconi Disease, in Galactosemia and in Obscure Syndrome, Arch. Dis. Childhood **29:**224-231 (June) 1954.

21. Schwarz, V.; Goldberg, L.; Komrower, G. M.; and Holzel, A.: Metabolic Observations on Erythrocytes from Cases of Galactosaemia, abstracted, Biochem. J. **59:**22 (March) 1955.

22. (*a*) Kalckar, H. M.: Biochemical Mutations in Man and Microorganisms, Science **125:**105-108 (Jan. 18) 1957. (*b*) Isselbacher, K. J.; Anderson, E. P.; Kurahashi, K.; and Kalckar, H. M.: Congenital Galactosemia, Single Enzymatic Block in Galactose Metabolism, ibid. **123:**635-636 (April 13) 1956.

23. Anderson, E. P.; Kalckar, H. M.; Kurahashi, K.; and Isselbacher, K. J.: Specific Enzymatic Assay for Diagnosis of Congenital Galactosemia: I. Consumption Test, J. Lab. & Clin. Med. **50:**469-477 (Sept.) 1957. Maxwell, E. S.; Kalckar, H. M.; and Bynum, E.: II. Combined Test with 4-Epimerase, ibid. **50:**478-481 (Sept.) 1957. Isselbacher, K. J.: Clinical and Biochemical Observations in Galactosemia, Am. J. Clin. Nutrition **5:**527-532 (Sept.-Oct.) 1957.

24. Armstrong, M. D.; Low, N. L.; and Bosma, J. F.: Studies on Phenylketonuria: IX. Further Observations on Effect of Phenylalanine Restricted Diet on Patients with Phenylketonuria, Am. J. Clin. Nutrition **5:**543-554 (Sept.-Oct.) 1957.

25. (*a*) Holzel, A.; Komrower, G. M.; and Schwarz, J.: Galactosaemia, Am. J. Med. **22:**703-711 (May) 1957. (*b*) Cox, P. J. N., and Pugh, R. J. P.: Galactosaemia, Brit. M. J. **2:**613-618 (Sept. 11) 1954.

26. References 7 and 25*a*.

COUNCIL ON FOODS AND NUTRITION

The following is one of the six papers presented at the symposium on "Nutrition in
nancy" in Columbia, Mo., Oct. 11, 1957. This symposium was sponsored by the Counc
Foods and Nutrition, with the cooperation of the Boone County Medical Society, the Uni
ity of Missouri School of Medicine, and the Adult Education and Extension Service
the University of Missouri.

PHILIP L. WHITE, SC.D., *Secretar*
Council on Foods and Nutritio

PRODUCTION OF CONGENITAL MALFORMATIONS BY DIETARY MEASURES

EXPERIMENTS IN MAMMALS

Josef Warkany, M.D., Cincinnati

In recent years there has been increasing interest in questions connected with the origin of congenital malformations, and unusual attention has been focused on animal experiments that result in deformed offspring. Experimental production of congenital malformations in lower animals has been possible for many decades, but systematic modification of mammalian embryos became practicable only during the last 25 years. Many methods are now available that permit production of congenital malformations in mammals, and among these are nutritional experiments that have been widely used as an instrument of teratological research.

As early as 1933, Hale[1] demonstrated that congenital malformations can be induced in pigs by a deficient maternal diet. In these experiments gilts of known stock were fed a diet deficient in vitamin A and possibly also deficient in other nutritional factors. The offspring showed microphthalmia or anophthalmos, accessory ears, cleft palate with harelip, and ectopic kidneys. In control animals Hale showed that supplementation with cod liver oil or green fodder prevented the anomalies. He also ruled out genetic determination of these malformations by matings of abnormal sons to their mothers or of abnormal brothers to their abnormal sisters. If the females were fed an adequate diet during pregnancy, such matings always resulted in normal offspring.

Results of Various Vitamin Deficiencies

Riboflavin.—Extensive studies in small laboratory animals were made possible when my associates and I found that a syndrome of skeletal malformations could be induced in rats[2] by maternal riboflavin deficiency.[3] Under strict experimental conditions, about one-third of the young were found to be abnormal. There was often shortness of the tibia, fibula, radius, ulna, and mandible and fusion of the ribs. Cleft palate was present in about
of the abnormal young. Since hundreds o
tive offspring were obtainable with this me
was possible to study the differing suscept
of the various skeletal elements, to obse
histological changes in bone and cartilage,
determine the time in gestation when the v
deficiency changed the development of the a
structures.[4] These experiments showed that
metrical and "familial" congenital malform-
could be induced in mammals by environ
conditions, a possibility denied by many gene
up to that time. The studies demonstrated t
high incidence of posterior cleft palate (wi
harelip), an internal skeletal malformation, ca
induced by a chemical deficiency in stocks o
that were free of the anomaly. In these experi
maternal riboflavin deficiency resulted chiefl
skeletal malformations in the offspring, wh
soft-tissue anomalies were very rare.[3]

Vitamin A.—Since Hale had produced malfo
tions in pigs by maternal vitamin A deficie
attempts were also made to breed female rat
pleted of vitamin A. In these experiments, the
pective mothers were given a diet low in vitam
from the time of weaning, but carotene was a
in small and measured amounts to make gr
and maturation possible. After breeding, th
males were given a diet free of vitamin A. A
drome of congenital malformations was induce
a high percentage of the young. The eyes,[5]
urogenital tract,[6] the diaphragm, the heart, and
aortic arches[7] were chiefly involved; striking ske
tal malformations, such as those produced by rib
flavin deficiency, were absent. It is possible th
to study in rats the morphogenesis of certain m
formations of the eye, the great vessels, the hea
and the kidneys. These experiments also shed lig
on some theoretical questions of prenatal physi
ogy. For instance, the fact that fetuses under
days did not show the classical signs of vitamin

From the Children's Hospital Research Foundation and the Department of Pediatrics, College of Medicine, University of Cincinnati.

deficiency, namely, keratinizing epithelial metaplasia, and that older fetuses did exhibit these signs illustrates that differing fetal age groups react differently to the same deficiency. The fact that an experimental procedure, such as prenatal vitamin A deficiency, could induce malformations of the genital ducts and of the urogenital sinus in both male and female young proved of interest to those investigating the origins of pseudohermaphroditism.[6]

Vitamin B Complex.—Although early experiments in riboflavin deficiency did not result regularly in malformations of soft tissues, prenatal deficiencies in other vitamins of the B complex did. Hogan and co-workers[8] observed that a maternal diet deficient in folic acid and cyanocobalamin (vitamin B_{12}) induced a high incidence of hydrocephalus in infant rats, and Lefebvres-Boisselot[9] produced exencephaly and ocular defects by pantothenic acid deficiency.

Vitamin E.—Most of the deficiency experiments cited thus far were simple depletion experiments. In later experiments, it was shown that it was sometimes necessary to limit the depletion period to early pregnancy and to feed an adequate diet later, so that the deformed fetuses could live to term. Such a procedure had to be employed to obtain malformations by vitamin E deficiency. As a rule, vitamin E deficiency in pregnant rats results in fetal absorption[10]; however, survival of fetuses can be achieved if the deficient maternal diet is supplemented by vitamin E on days 9, 10, and 11 of gestation. Supplements with vitamin E in midpregnancy salvage some of the embryos damaged by the deficiency during early organogenesis, resulting in the birth of young, with malformations.[11]

Role of Antimetabolites

The introduction of antimetabolites into nutritional teratology represented a significant step forward. The early experiments in which dietary depletion was practiced were laborious and delicate, since with this method it was difficult to create borderline deficiencies that would injure the developing embryo without killing it. The depletion period necessary before the females could be bred extended over weeks or even months. When, for instance, a diet deficient in riboflavin was fed only during gestation, but not before, the resulting depletion was insufficient to produce congenital malformations in the young rats. However, when Nelson and co-workers[12] added the antimetabolite galactoflavin to such a diet, deficiency could be created within a few days. In this way it became possible to begin the experiments at or even after conception and to omit the long preparatory periods, and malformations could be produced in 64% of the offspring. Compared with the original procedure,[2] the yield of abnormal offspring could be doubled. In general, the skeletal malformations produced by combination of a diet deficient in riboflavin plus administration of galactoflavin were identical with those produced in earlier experiments by riboflavin deficiency alone. However, the addition of galactoflavin did change the syndrome, since soft-tissue malformations occurred in more than one-third of the abnormal young animals.[12]

Folic acid (pteroylglutamic acid, PGA) deficiency was developed into a most efficient teratogenic instrument. Giroud and Lefebvres-Boisselot[13] added 5% succinylsulfathiazole (Sulfasuxidine) as an intestinal antibiotic to a maternal diet deficient in folic acid and obtained young with eye and brain defects, harelip, and other facial anomalies. Nelson and co-workers[14] employed a purified diet deficient in folic acid, containing 1% succinylsulfathiazole and 0.5% x-methylfolic acid, a crude folic acid antagonist. This diet was capable of rapidly producing a deficiency of folic acid and a high incidence of congenital malformations in the young rats. For instance, when this diet was fed for three days (days 9, 10, and 11 of pregnancy), a great variety of malformations could be obtained in 99% of the offspring. Multiple skeletal defects, cardiovascular, ocular, and urogenital anomalies, and abdominal and diaphragmatic hernias were observed. When this diet was fed on the 10th to 13th days of gestation, 100% of the offspring had cleft palate. In addition, many had other skeletal defects and urogenital anomalies. The types and incidence of congenital anomalies resulting from a transitory deficiency period of a few days varied with the time of instituting the deficiency and with its duration and severity.[15] The high yield of abnormal young obtained by this rapid treatment can probably be attributed to the fact that the embryo can be severely injured by the deficiency of folic acid, whereas the mothers are not adversely affected. This deficiency effect makes possible the survival of a large number of deformed fetuses in the uterus of mothers who remain in good health and gain weight during the short experimental period.

The teratogenic power of folic acid antagonists is also demonstrated by the effects of aminopterin (4-aminofolic acid) on embryos of mothers receiving adequate diets. Thiersch[16] observed hydrocephalus, meningo-encephalocele, harelip, and cleft palate in human embryos whose mothers had been given aminopterin to induce therapeutic abortion. Other antimetabolites with teratogenic action have been examined in experimental animals.[17]

Teratological Effect of Hypervitaminosis A

Cohlan's[18] interesting discovery that hypervitaminosis A is teratogenic must be mentioned briefly. Huge doses of vitamin A administered to pregnant rats during organogenesis produced malformations in many of the young. Exencephaly, hydrocephalus, spina bifida, ocular defects, cleft palate, and other skeletal malformations were observed as the result of this treatment. Although the mode of action of this agent is not clear, there can be no doubt about its effectiveness. The experiments of Cohlan have been confirmed in our laboratory and have been extended by Giroud and Martinet[19] who studied the time factors involved and the anatomic details of some of the malformations.

Most of the work mentioned here was done with rats of commercial stocks or with rats bred and reared for many years in scientific institutions. The experiments were usually well controlled, and the incidence of spontaneous congenital malformations was low in such stocks. As a rule, the results of the various teratogenic agents were the same, irrespective of the origin of the rats; however, minor discrepancies in different laboratories were sometimes attributed to "strain" differences. Genetic studies were not made in these rat experiments.

Genetic Factors

A few nutritional studies were done with inbred strains of mice to investigate the differential susceptibility of genetically differing strains of mice to the same teratogenic agent. By using genetically standardized animals, it is also possible to demonstrate the effects of nutritional deficiencies upon embryonic morphogenesis. Kalter and I[20] examined the congenital malformations induced in inbred strains of mice by feeding diets deficient in riboflavin to which galactoflavin had been added. The teratogenic diets successfully used by Nelson and others[12] in rats had to be modified, since the mice did not reproduce under the dietary conditions that were effective in rats. A large variety of malformations was obtained in the young mice when the diets were fed to the mother from the 10th to the 14th days of gestation. The mice used were of the highly inbred A/Jax, DBA, 129, and $C_{57}BL$ strains. Skeletal anomalies could be detected by gross inspection or by clearing of the specimens, and soft-tissue anomalies were found in histological sections. Some of the malformations produced in these mice resembled those produced by the same method in rats; however, there were differences in the two species, and there were differences in the malformations in the offspring of the four strains of mice. Atresia of the esophagus, for instance, was induced by this method in about 80% of the young of strains A/Jax and DBA but in only 2% of the $C_{57}BL$ offspring. The pattern of malformations presented by each strain of mice was more or less specific.

An interesting observation was made by Runner and Miller[21] in the young of mice of strain 129. When females of that strain were fasted for 24 hours during the ninth day of pregnancy, exencephaly, vertebral anomalies, and fused ribs were induced in 28% of the fetuses. It is noteworthy that, in the presence of a certain genetic constitution, temporary maternal starvation, a rather unspecific nutritional deficiency, can result in congenital malformations of the young.

In addition to these studies, other investigations have been conducted in this field. For a more complete orientation, the reader is referred to other extensive reviews in the literature.[22]

Interpretation of Experiments

A few remarks about the interpretation of the experiments cited may be in order. It should be stated at the outset that the experiments do not prove that congenital malformations in man are due to maternal dietary deficiencies. Those acquainted with the details of the experimental nutritional methods resulting in congenital malformations appreciate the differences between the experimental conditions employed and the conditions of human reproduction. When we speak of a dietary deficiency as a cause of malformations in experimental animals, we usually mention only one of the factors involved in the production of the congenital malformations. To make the experiment successful, that is, to create a borderline deficiency injurious but not lethal to the embryos, the depletion time must be regulated according to the mother's ability to store and restore the particular nutritional factor. Sometimes the depletion must be terminated prematurely at a certain period of gestation by administration of a supplement to avoid complete destruction of the damaged fetus; some depletion methods require administration of inhibitors or antimetabolites. The outcome of the experiment also depends upon the genetic make-up of the animal species or strain selected for the experiment.

The fact that a teratogenic method produces a certain malformation in rats does not permit the conclusion that it will be equally effective in mice. How much more hazardous is it then to equate such animal experiments with human conditions. However, in certain cases adverse nutritional conditions of the mother may impair the development of human fetuses; for example, endemic cretinism has been attributed to maternal iodine deficiency. Although the etiology of endemic goiter[23] and cretinism is complex, these conditions disappear when iodized salt or improved diets are introduced into the endemic areas.[24] Antimetabolites that are teratogenic in animals may also be teratogenic in man.[16] The fact that starvation in early pregnancy can cause malformations in the young of some inbred strains of mice[21] cannot be ignored, since anorexia, vomiting, or lack of food could, in rare instances, cause comparable situations in women. It should be emphasized that, to date, the teratogenic effect of starvation has been demonstrated only in the presence of certain maternal attributes and that it may depend to a great extent upon the genetic constitution of the mother and the embryo.

Although the experiments cited may not be of practical importance at this time, they have influenced many theories concerned with congenital malformations. The early investigators who worked in nutritional teratology were searching for an experimental method to produce congenital malformations in mammals. They succeeded in demonstrating that adverse environmental conditions must be considered as possible causes of prenatal deformities and that these conditions could be of a rather subtle nature.

In recent years other teratogenic methods have been developed which supplement early nutritional studies. Some of these methods require less skill and effort than the nutritional studies and are, therefore, preferable for certain teratological investigations. However, the nutritional studies mentioned point to the importance of well-defined chemical compounds whose role in prenatal development had not been recognized before. Some of these substances are known to be constituents of enzyme systems which may be rendered ineffective by the lack of such nutritional elements. Since it is generally assumed that genetic mechanisms are mediated through enzymatic activity, I should like to express the hope that nutritional teratology will eventually benefit genetic investigations concerned with the mode of action of abnormal genes. It is possible that both genic "deficiencies" and certain prenatal nutritional deficiencies result in aberrations of similar enzymatic processes necessary for normal development.[25] In the field of teratology there is common ground for the developmental geneticist and the nutritionist. In this area teratogenic nutritional experiments may eventually make their greatest contribution to the science of teratology.

Summary

Many methods are now available that permit production of congenital malformations in mammals, and among these are nutritional experiments that have been widely used as instruments of teratological research. Congenital defects of the central nervous system, of the eyes, of the skeleton, and of the cardiovascular, urogenital, and other systems have been produced under strict experimental conditions. In the application of such animal experiments to questions of congenital malformations in man, great caution must be exercised, since the animals are subjected to artificial environmental conditions which are not likely to occur in human beings.

This study was supported by grants from the National Institute of Arthritis and Metabolic Diseases, U. S. Public Health Service, and the National Vitamin Foundation, Inc.

References

1. Hale, F.: Pigs Born Without Eyeballs, J. Hered. **24:** 105-106, 1933.

2. Warkany, J., and Nelson, R. C.: Appearance of Skeletal Abnormalities in Offspring of Rats Reared on Deficient Diet, Science **92:**383-384 (Oct. 25) 1940.

3. Warkany, J., and Schraffenberger, E.: Congenital Malformations Induced in Rats by Maternal Nutritional Deficiency: VI. Preventive Factor, J. Nutrition **27:**477-484 (June) 1944.

4. Warkany, J., and Nelson, R. C.: Skeletal Abnormalities Induced in Rats by Maternal Nutritional Deficiency: Histological Studies, Arch. Path. **34:**375-384 (Aug.) 1942.

5. Warkany, J., and Schraffenberger, E.: Congenital Malformations Induced in Rats by Maternal Vitamin A Deficiency: I. Defects of Eye, Arch. Ophth. **35:**150-169 (Feb.) 1946.

6. Wilson, J. G., and Warkany, J.: Malformations in the Genito-urinary Tract Induced by Maternal Vitamin A Deficiency in Rat, Am. J. Anat. **83:**357-407 (Nov.) 1948.

7. Wilson, J. G., and Warkany, J.: Aortic Arch and Cardiac Anomalies in Offspring of Vitamin A Deficient Rats, Am. J. Anat. **85:**113-155 (July) 1949.

8. Hogan, A. G.; O'Dell, B. L.; and Whitley, J. R.: Maternal Nutrition and Hydrocephalus in Newborn Rats, Proc. Soc. Exper. Biol. & Med. **74:**293-296 (June) 1950.

9. Lefebvres-Boisselot, J.: Role tératogène de la déficience en acide pantothénique chez le rat, Ann. méd. **52:**225-298, 1951.

10. Evans, H. M.; Burr, G. O.; and Althausen, T. L.: Antisterility Vitamine—Fat Soluble E, Mem. Univ. Calif. **8:**1-176, 1927.

11. Cheng, D. W., and Thomas, B. H.: Relationship of Time of Therapy to Teratogeny in Maternal Avitaminosis E, Proc. Iowa Acad. Sc. **60:**290-299, 1953.

12. Nelson, M. M.; Baird, C. D. C.; Wright, H. V.; and Evans, H. M.: Multiple Congenital Abnormalities in Rat Resulting from Riboflavin Deficiency Induced by Antimetabolite Galactoflavin, J. Nutrition **58:**125-134 (Jan.) 1956.

13. Giroud, A., and Lefebvres-Boisselot, J.: Anomalies provoquées chez le foetus en l'absence d'acide folique, Arch. franç. pédiat. **8:**648-656, 1951.

14. Nelson, M. M.; Asling, C. W.; and Evans, H. M.: Production of Congenital Abnormalities in Young by Maternal Pteroylglutamic Acid Deficiency During Gestation, J. Nutrition **48:**61-79 (Sept.) 1952.

15. Nelson, M. M.; Wright, H. V.; Asling, C. W.; and Evans, H. M.: Multiple Congenital Abnormalities Resulting from Transitory Deficiency of Pteroylglutamic Acid During Gestation in Rat, J. Nutrition **56:**349-369 (July) 1955.

16 Thiersch, J. B.: Therapeutic Abortions with Folic Acid Antagonist, 4-Aminopteroylglutamic acid (4-Amino P. G. A.) Administered by Oral Route, Am. J. Obst. & Gynec. **63:**1298-1304 (June) 1952.

17. Murphy, M. L., and Karnofsky, D. A.: Effect of Azaserine and Other Growth-inhibiting Agents on Fetal Development of Rat, Cancer **9:**955-962 (Sept.-Oct.) 1956.

18. Cohlan, S. Q.: Congenital Anomalies in Rat Produced by Excessive Intake of Vitamin A During Pregnancy, Pediatrics **13:**556-567 (June) 1954.

19. Giroud, A., and Martinet, M.: Malformations diverses du foetus de rat suivant les stades d'administration de vitamine A en excés, Compt. rend. Soc. biol. **149:**1088-1090, 1955.

20. Kalter, H., and Warkany, J.: Congenital Malformations in Inbred Strains of Mice Induced by Riboflavin-Deficient, Galactoflavin-Containing Diets, J. Exper. Zool. **136:**531-566, 1957.

21. Runner, M. N., and Miller, J. R.: Congenital Deformity in Mouse as Consequence of Fasting, abstracted, Anat. Rec. **124:**437-438 (Feb.) 1956.

22. Warkany, J.: Disturbances of Embryonic Development by Maternal Vitamin Deficiencies, J. Cell. & Comp. Physiol. (supp. 1) **43:**207-236 (May) 1954. Giroud, A.: Carences maternelles en acide pantothénique et en acide folique, Ét néonatal. **1:**5-23, 1952. Nelson, M. M.: Production of Congenital Anomalies in Mammals by Maternal Dietary Deficiencies, Pediatrics **19:**764-776, 1957.

23. Greenwald, I.: Is Endemic Goiter Due to Lack of Iodine?, J. Clin. Endocrinol. **6:**708-741, 1946.

24. Wespi, H. J.: Jodprophylaxe und Jodmangel theorie: Untersuchungen über die Schilddrüsenverhältnisse bei Schulkindern in einigen Schweizer Dörfern, Schweiz. med. Wchnschr. **83:**452-458 (May 9) 1953.

25. Warkany, J.: Congenital Malformations Induced by Maternal Dietary Deficiency: Experiments and Their Interpretations, Harvey Lect. (1952-1953) **48:**89-109, 1954.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . AUSTIN SMITH, M.D.
Associate Editor . . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

TEN YEARS OF SPACE MEDICINE

CIVILIAN and military scientists are cooperating extensively to devise a vehicle in which man may be safely lifted into outer space, perhaps as far as the moon or some planet. A project so immensely complex and far reaching requires the knowledge and skills of many groups of scientists—astronomers, physicists, chemists, biologists, engineers, botanists, metallurgists, psychologists, physicians, and others. Already the engineering capability exists to launch rocket vehicles at orbital or escape velocities; however, the techniques devised to keep the human astronaut healthy, to rescue him in case of disaster, and to bring him back safely to earth are in need of many refinements. To this end, the U. S. Air Force School of Aviation Medicine, nearly 10 years ago, founded a department of space medicine which was the first branch of any educational or research institution concerning itself solely with conditions that man would meet in space. The research accomplished by this school serves today as the foundation of all planning in the United States and abroad for man's venture into space.

To review the accomplishments and discuss the unsolved problems, the school with the assistance of the Southwest Research Institute convened an international symposium on space medicine a few days ago at San Antonio, Texas. In this assembly of more than 600 scientists, confidence prevailed in ultimate success. However, extremely difficult problems stand in the way.

Long-time manned space flight in a sealed cabin demands, without prohibitive weight, the provision of food, the disposal of excreta, and the gas exchange requirements. As an approach to these problems, Prof. Jack Myers of the University of Texas has investigated the possibility of using oxygen-producing algae. A photosynthetic gas-recycling system would provide oxygen produced by the algae for the man to breathe and the algae would complete the gas-exchange cycle by growing on the carbon dioxide exhaled by the man. The algae would also manufacture food materials necessary for the sealed-in space navigator. Dr. Myers reported an experiment in which he used mice and the green alga Chlorella which operated satisfactorily for one month and could have been continued longer. He has emphasized that, while no use of this procedure is reasonably foreseen in the immediate future, the experiment provides a demonstration of operation of a photosynthetic gas exchanger and should contribute to a long range kind of operation.

In a panel on space problems presented by the Association of Military Surgeons of the United States in Washington, D. C., in November, Finkelstein and Taylor, reporting from the Wright-Patterson Air Force Base, said that a practical means to regenerate the carbon and nitrogen compounds man needs will remove all food limitations to the duration of space flight. The technical feasibility of such regenerative cycling is not in question and research in the strict sense of the word is not required. Technical development and applied research however, are needed. Work is under way to find a more efficient form of algae and there has been considerable speculation about the possibility of algae as a source of food.

Kitzes, of the Wright Air Development Center said that eventually closed ecological systems will be available to provide complete regeneration and reclamation of all gaseous, liquid, and solid materials needed in normal human metabolism. Champlin of the Army Ordnance Missile Command, noted before the panel in Washington that many volunteers for space flight have already declared themselves. Volunteers obviously should meet various special physical and mental requirements. Actually, it was stated, certain physical handicaps may be an advantage in space flight.

Many of the other problems discussed at San Antonio, which the School of Aviation Medicine is trying to solve, involved advanced training in areas far removed from the present-day knowledge of most practicing physicians.

Prof. Hubertus Strughold, often referred to as the father of space medicine, in reviewing the 10 years that have elapsed since the first scientific meeting was held on the medical problems of space flight, said at the San Antonio meeting: "We have complete knowledge about certain factors in space flight; about others we have some knowledge, and about the rest we depend entirely on extrapolations or even on speculations." And yet he is confident that research will find the answer to many of the unsolved problems. "There is no question," he said, "that Mars and Venus, besides the Moon, will be targets of manned space operations within this century."

BUREAU OF MEDICAL ECONOMIC RESEARCH

A BOOK ON MEDICAL CARE

Vaughn D. Bornet, Ph.D.

The five specialists in the field of public health who extracted and assembled the material for the book "Readings in Medical Care"[1] express the hope that their book will contribute to "sound and realistic solutions of medical care questions of the future by making knowledge about past and present problems more conveniently accessible." They tried, they say, "to choose the most useful and informative writings available and to include items representing differing points of view on controversial questions." "Readings in Medical Care" is the creation of Drs. Solomon J. Axelrod (University of Michigan School of Public Health), Franz Goldmann (Harvard University School of Public Health), Milton Terris (University of Buffalo School of Medicine), Jonas N. Muller (New York Medical College), and Cecil G. Sheps (Beth Israel Hospital), assisted on editorial matters by Edward B. Kovar. It is specifically stated in the Preface that the Association of Teachers of Preventive Medicine took "no active part" in determining content. The Committee on Medical Care Teaching, for its part, merely "advised the editors on the scope and general orientation of the volume, but not on the choice of specific material for inclusion."

The Problem of Selection

A certain directional aspect is placed on the book in the Foreword by Dr. George Packer Berry, dean of the faculty of medicine at Harvard University, who observes that rapid changes in society and medical science mean that "the framework and content of medical care and health service will inevitably have to change." And he judges that the present volume is in fact "a balanced and representative collection." In the light of these several statements of hope and appraisal the task of the reviewer is clearly outlined in advance. Does the book realize these aspirations? Does it justify these judgments?

At the outset, one must observe that a book of readings destined for use by students of medical care organization shares some of the responsibilities inescapable in compilations of this character commonly seen in our universities. Such books of readings are basically a substitute for the original publications. No longer need students who own such a book browse in the library stacks, explore reserve book shelves, or search out old magazines in periodical rooms. The card catalog, guides to periodical literature, and library reference personnel have been bypassed. The open market place, where published materials and ideas find their level, is closed in a sense by all who select and reprint under one cover what they consider to be the important materials of the field. To assemble, extract, arrange, and properly introduce a tiny portion of the total literature of a technical area of scholarship and affairs to the end that teachers will be able to present students with a reliable and realistic portrait in miniature is to shoulder a heavy load. The burden of the reviewer is only a little lighter, for he must try to make clear the apparent extent of the over-all accomplishment.

Analysis of "Readings in Medical Care" may properly begin with the 122 selections incorporated in its 13 parts, for there are only 15 pages of original material out of 694 pages. There are few explanatory footnotes, and it was a questionable editorial decision to eliminate almost all footnotes from the original items. These key decisions will certainly be severely questioned by teachers who choose to adopt the book for student use. Extracts from diversified secondary sources seldom, if ever, speak clearly to the uninitiated without at least some editorial interpretation. Even if the one-page essays which introduce each of the 13 parts of the book had been uniform in quality, they would be no substitute for the road map these learned editors did not bother to provide. One assumes that they were thoroughly familiar with many pertinent details about the cited authors and organizations; the circumstances of original publication were normally known to them; but they passed on to the student none of this highly relevant lore. In some classrooms, therefore, "Readings in Medical Care" may raise more questions for the teacher than it solves.

Topics and Space

The editors view the problem of illuminating the subject of "medical care" chiefly in terms of physicians, hospitals, government, insurance, and the public. They give little space to dentistry and virtually none to the pharmaceutical industry or to the significance of its products. More than three-quarters of a 106-page section on The Medical Care Team is given to physicians. Dentists, medical social workers, technicians, and nurses share what is left. Does this decision on emphasis best meet the needs of medical students and young people in

---

Research Associate, Bureau of Medical Economic Research, American Medical Association.

graduate schools of public health? One may well doubt it. Over-all, the editors divided their space as is shown in the table.

In examining this table it should be borne in mind that the Selections are the excerpts actually comprising the present book, while the "Further Readings" are the lists given at the close of each part; a title appears in one or the other, but not both. Many of the selections come from the same printed source ("Medical Care for Americans," a 1951 publication, provided five selections; "Building America's Health," the product of the President's Commission on the Health Needs of the Nation, 1952-1953, furnished six). Yet each book or article was listed at the close of no more than 1 of the 13 parts. No reasonable reason for this peculiar decision comes to mind. Certainly to list such comprehensive books as "Financing Hospital Care in the United States" (3 volumes) only at the close of the section on insurance and not at all in the section on hospitals (a typical and necessary consequence of such a decision) makes the bibliographical lists strangely lopsided. "Paying for Medical Care in the United States," by Oscar N. Serbein Jr., a compendium with 237 tables, is listed only once, even though its contents (like a great many others of the 177 "Further Readings") are related to fully half a dozen of the sections of the book under review here. Before leaving the subject of bibliographical references, it must be said that little effort was made to cite important articles in periodicals, even though the periodical and pamphlet literature on medical care is extensive and rich. The bibliography in Serbein's 1953 book, for example, lists 25 items by the Bureau of Medical Economic Research of the American Medical Association, but the present book (1958) lists only 9; Serbein lists 11 items by Selwyn D. Collins, while the present volume mentions only 3. Other examples could be given, each illustrating the point.

Division of Space in "Readings in Medical Care"

Part	Title	No. of Pages (1)	No. of Selections (2)	No. of "Further Readings" (3)
I.	Problems in Medical Care: the General Background	29	5	9
II.	The National Health Picture	45	10	16
III.	Adequacy of Medical Care	40	9	3
IV.	The Costs of Medical Care	34	9	10
V.	The Medical Care Team	166	15	18
VI	Hospitals	75	10	12
VII.	Coordination in Health and Medical Service	44	10	11
VIII	Care of Long-Term Illness	48	9	13
IX.	Rural Medical Care	24	6	7
X.	Public Medical Care	49	5	27
XI.	Medical Care in Industry	60	11	20
XII.	Medical Care Insurance	110	16	21
XIII.	Principles and Proposals	30	7	10
	Totals	694	122	177

Referring back to the table above, the decisions made on division of space by subject come under review. Medical Care Insurance and The Medical Care Team are the longest of the parts; Rural Medical Care, Principles and Proposals, Problems in Medical Care, and The Costs of Medical Care are the shortest. Authorities will no doubt disagree on the space that might have been given to each of these subjects.

When Is Contemporary?

Bearing in mind the objectives stated by the editors, one is surprised at the age of many of the readings excerpted in "Readings in Medical Care." Their average (mean) and median year of publication is 1949. The section (part) on the adequacy of medical care consists of selections published in 1932-1933, 1947, 1949, and 1954. When is contemporary? Of the 122 extracts, 8 were originally published in 1931-1940, 67 in 1941-1950, and 47 in more recent years; only two extracts in this 1958 publication date from later than 1955. What are we to think as we survey this situation? It may be that some of the writings chosen have not been replaced; for example, the studies of the Bureau of Medical Economic Research of the American Medical Association on the distribution of physicians are the latest. It is a service, furthermore, to remind students of old controversies and of the extreme positions taken by some during the decade after World War II. Yet difficulties arise from the decision of the editors to print so many materials which do not portray accurately the medical care realities of the post-Korean years. The median year of all publications mentioned in the bibliographical lists is four years later (1953 versus 1949) than that of the extracts chosen for reprinting by the editors.

Free Choice and Fee-for-Service

Remembering the several assertions of the editors regarding their self-imposed goal of giving students items representing differing points of view and of communicating to them knowledge about past and present problems in the socioeconomic field of medical care, the present reviewer tested the book on several important matters. First, the principle of free choice of physician is singularly ignored in this book. The selection from a 1945 book of Dr. Franz Goldmann mentions the existence of a "vast literature" in favor of free choice (page 347). That is true. But the five experts who shared responsibility for these pages (including Dr. Goldmann) did not see fit to include a single item devoted to the defense of free choice. The only index reference is to unsympathetic comments by the latter. Is free choice of physician unrelated to the past, present, and future of medical care?

A second subject tested by the reviewer was "fee-for-service" as a form of paying for medical care. There are three short treatments of the matter. In a quoted 1952 statement, Dr. Goldmann curtly conveys its alleged advantages in three brief sentences and then attempts to tear it apart in half a page of earnest prose (page 194). A second mention is in a 1946 congressional committee report; there, the extra paperwork supposedly accompanying fee-for-service is stated to be an important defect of that method of payment. In a third reference (page 660) Dr. Ernst P. Boas judges in his 1945 publication of the Society for Ethical Culture that "Insurance guaranteeing complete medical coverage cannot be set up, except at a prohibitive cost, if the fee-for-service principle is retained." It forces on health insurance, moreover, "a complicated and expensive system of checks to detect cheating." One may safely conclude that fee-for-service was not considered particularly worthy of student consideration by those who compiled the present book.

Since the word "ethics" does not appear in the Index, "Hippocratic Oath" was checked through the book as a substitute. It, too, was deemphasized to the point of extinction. Dr. Goldmann informs his young readers on page 199 that "If the physician lives up to professional ideals and strictly observes the code of ethics embodied in the Hippocratic oath he may well conclude his days in poverty. If he acts like a businessman he can acquire a big bank account and a large estate within a few years but will furnish ample ammunition for complaints about commercialism in the system of private practice. A well organized and efficiently administered system of paying physicians for service in medical care programs can markedly reduce the dilemma confronting the possessor of the most humane of arts" (1952). Finally, as a preliminary to an attack on free choice of physician, Wendell Berge, an attorney, is quoted as saying in 1945, "Let us briefly survey the great trends which converge upon medicine, for they decree a revision of means if the great ends of the Hippocratic Oath are to be served" (page 668). Among other rays of light directed on medical practice by this "expert" in a 10-page extract are these: "To me it seems that one of the great shortcomings of the prevailing medical system is that the practitioner is kept so busy with his patients that he cannot translate his work into medical discovery" (page 676). And, "If there is one field where freedom of choice should be qualified, it is medicine" (page 671). For him, "A new medical order is inevitable." Why were his views in the section on Principles and Proposals (the book's conclusion) given a third of the space while the American Medical Association and American Dental Association share only three pages?

Returning to the time element as presented in "Readings in Medical Care," one notes the heavy concentration on the years of the first Truman Administration. Fifty-one of the quoted materials derive from that era. Opinions will differ sharply on the wisdom of including so many of these materials, especially on including them without some clearcut method of indicating how deceiving is the repeated use of the words "now" and "at the present time" and their equivalents. Certainly it is no service to students to hand them without comment such dogmatic evaluations as that of Dr. Boas (1945), "For all these reasons, protection offered by voluntary sickness insurance in this country is minute in comparison to the need." Furthermore, "National compulsory health insurance is the only practical method of spreading the benefits of good medical care to the whole population" (pages 660, 661). In any event, the coverage of voluntary health insurance in this book is hopelessly out of date and decidedly misleading.

Selected Selections

In concluding their pioneering volume, one which performs a useful bibliographical service by reminding us of the variety of the literature published on medical care during the past quarter century, the editors write (page 666), "Hopefully, the background of information and the stimulation of the ideas presented in these pages will help us to select the more meaningful of these many proposals [on the organization and financing of medical care], to evaluate them intelligently, and to act upon them as mature and understanding citizens." In the opinion of the reviewer, however, this hope of intelligent evaluation and appropriate action based on study of the present book has a chance of being realized only in the case of readers who lived through the era when these proposals were popularized and who are thoroughly conversant with present trends in the medical care field. For it must be said that "Readings in Medical Care" does not present the alternatives on many major matters in the medical care field with equal skill or enthusiasm. Students will certainly need many additional reading assignments from the past and the present if they are to arrive at reasonably balanced judgments.

References

1. Readings in Medical Care, edited by the Committee on Medical Care Teaching of the Association of Teachers of Preventive Medicine, Chapel Hill, University of North Carolina Press, 1958.

MEDICAL NEWS

ALABAMA

Grant for New Psychiatric Clinic.—Announcement was made recently of a federal fund grant of $196,187 for a new psychiatric clinic at the University of Alabama Medical Center. Located at University Hospital, it is the first unit of a proposed new ambulant patient center. Designed to handle an estimated 25,000 patients a year as well as for expanded research and teaching purposes, the clinic is a self-financing operation, since no community funds are available for the hospital's vast indigent out-patient service. The present psychiatric clinic is located in offices on the second floor of a store at the Medical Center. The new clinic will be constructed in the block chosen for the proposed out-patient center, bounded by Sixth and Seventh Avenues and 17th and 18th Streets, south, Birmingham.

CALIFORNIA

Dr. Newell Honored.—The Gold Medal of the Radiological Society of North America was presented Nov. 20 to Dr. Robert R. Newell, San Francisco, during the 44th annual meeting of the society in Chicago. Dr. Newell is emeritus professor of medicine (radiology) Stanford University Medical School and Scientific consultant to U. S. Naval Radiological Defense Laboratory, San Francisco. He was president of the American College of Radiology in 1951 and received the college's Gold Medal in 1957. He is currently a member of the National Committee on Radiation Protection.

Provost Appointed.—The appointment of Dr. John B. deC. M. Saunders as provost of the University of California Medical Center, San Francisco, and Willard C. Fleming, D.D.S., as vice-provost has been announced by President Clark Kerr, of the statewide university. Dr. Saunders will continue as dean of the School of Medicine and Dr. Fleming as dean of the College of Dentistry. In his new position as provost Dr. Saunders will be the responsible administrative chief of the Medical Center and Dr. Fleming will be his deputy. Dr. Saunders has exercised many of the duties of provost since he became dean of the School of Medicine in February, 1956.

Symposium on Aviation Medicine.—The present and future problems of space flight, small aircrafts, jet transportation, and flying safety were the major discussion topics at the fourth annual Symposium in Aviation Medicine, held Oct. 22-24 in Santa Monica, sponsored by the University of California School of Medicine and University of California Extension, Los Angeles. Dr. Coleman M. Whitlock, Jr., head of Human Factors, Space and Radiation Medicine of Convair Astronautics, San Diego, spoke on "Omnienvironmental Testing as Applied to Space Flight." Col. Harry G. Moseley, chief of the Aero Medical Safety Division, Directorate of Flight Safety Research, Norton Air Force Base, Calif., presented "Military Developments in Flying Safety." Mr. Al Blackburn, president of the Society of Experimental Test Pilots, discussed improved federal regulations to decrease aircraft collisions. On the last day of the meeting, "Man in the Space Environment" was discussed by Capt. Julian E. Ward, director of the Bioastronautics Group at the Inglewood, Calif., Air Force Ballistic Missile Division.

COLORADO

Large Grant for Research Facilities.—The U. S. Public Health Service has notified Dean Robert J. Glaser, of the University of Colorado School of Medicine, Denver, that it has approved a grant of $1,344,165 in matching funds for construction of research facilities at the Colorado University Medical Center. The funds are made available for new construction and remodeling in the center's long-range building program, and up to $140,665 of the matching grant may be used for equipment. The Medical Center's proposed $17,500,000 expansion program includes a new 405-bed hospital, medical and dental research facilities, outpatient clinics, and other construction north of the present campus. The federal funds are not for a specific building.

DISTRICT OF COLUMBIA

Dr. Habel Consults on Rabies in Latin America.—Dr. Karl Habel, research scientist of the National Institutes of Health, left Oct. 11 for six weeks of consultation with five Latin American governments. Officials of the Pan American Sanitary Bureau, Regional Office for the Americas of the World Health Organization, said Dr. Habel served as a consultant on rabies and other virus problems. As a staff member of the bureau's Pan American Zoonoses Center he visited Brazil, Argentina, Chile,

---

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

Peru, and Panama. Dr. Habel is a member of the WHO Expert Committee on Rabies and the originator of the Habel test for virus potency. At the Zoonoses Center, in Azul, Argentina, he helped with work being done in the virus laboratory. As recently as 1956, the year of the center's founding, there were 149 reported deaths in the hemisphere due to rabies. Every country of the Americas, save one, is said to have a rabies problem. The lone exception is Uruguay, where a successful eradication campaign was completed some 15 years ago.

ILLINOIS

Chicago

Medical History Meeting.—The Society of Medical History of Chicago will meet at the Institute of Medicine (fourth floor, 86 E. Randolph St.) Dec. 17, 8:00 p. m. This is an open meeting; all are welcome. Dr. Helmut P. G. Seckel, associate professor, department of pediatrics, University of Chicago, will present "The Vienna School of Pediatrics and the Concept of Allergy," after which Dr. E. Lee Strohl, associate professor of surgery, Northwestern University Medical School, will speak on "Ladies of Lynn—Emphasis on One."

Chicago Medical School Anniversary.—The Chicago Medical School marked the 10 years of its accreditation and approval "as a medical college of high standing" Nov. 25 at a dinner meeting in the Standard Club. The story, narrated by Alex Dreier, news commentator, concerned the early history of the school up to its approval on Nov. 9, 1948, by the American Medical Association and the Association of American Medical Colleges. Dr. John J. Sheinin, president of the school, described the future plans. A new research institute, the first of seven buildings to be erected on the 10 acres of ground in the West Side Medical Center, is in the planning stage and construction is expected to begin in spring.

Personal.—Dr. James E. Cassidy was named assistant director and chief of the medical unit of the Student Health Service of the University of Chicago, effective August 1.——Aaron Novick, Ph.D., who has been a member of the University of Chicago faculty for 11 years, has been named director of the Institute of Molecular Biology at the University of Oregon, Portland, effective Jan. 1.——University of Chicago faculty and friends of Dr. Paul C. Hodges, professor emeritus of radiology at the University of Chicago, held a dinner in his honor Nov. 6. He joined the faculty as one of the original members of the University Clinics staff and was appointed chairman of the department of radiology in 1927. He retired June 30, 1958. Scheduled speakers at the dinner were Chancellor Lawrence A. Kimpton, Ph.D.; Dr. Lowell T. Coggeshall, dean of the Division of Biological Sciences; and Dr. Franklin C. McLean, professor emeritus of physiology.

Founders Day Awards.—Dr. Richard H. Young, Northwestern University Medical School dean, presented awards to six medical school students and graduates Sept. 30 at a Founders Day convocation. The convocation honored the founders of the medical school and formally opened the school's 101st annual session. The Founders Day address was delivered by Dr. Guy P. Youmans, chairman, department of microbiology, who spoke on "The Other World." Dr. Robert C. Larlett, Tucson, Ariz., received the Borden undergraduate research award in medicine, $500 and a certificate, "given to a student in the graduating class who performed meritorious medical research while an undergraduate medical student." Winner of the George J. Dennis Phi Rho Sigma award was Harry L. Gibson, of Springfield, Mo., who received a $100 bond for maintaining the highest scholastic average during the first three years of medical school. Robert Lynn Parker, Box 6, Hollansburg, Ohio, was the recipient of the Phi Beta Pi–Leslie B. Arey award, "given to the freshman student for the highest scholastic achievement in the study of anatomy." The $50 award has been named in honor of Dr. Leslie B. Arey, professor emeritus of anatomy. Winner of the Roche award, given by Hoffman–LaRoche Inc., "for outstanding scholastic attainment during the sophomore year," was Albert D. Newcomer, Dixon, Ill. Mr. Newcomer was given a scroll and an engraved watch.

LOUISIANA

Lectureship in Social Psychiatry.—Tulane University, New Orleans, has announced the creation of a lectureship in social psychiatry jointly sponsored by the department of psychiatry and neurology and the department of sociology and anthropology and supported by the Mona Bronfman Sheckman Foundation. Dr. John P. Spiegel, the first speaker in this annual series of lectures, discussed "The Structure and Function of Social Rules in the Doctor-Patient Relationship" Oct. 23 through 25. The guest lecturers will be alternately a social scientist and a psychiatrist. The lectures will be published in monograph series. (For information contact the program co-chairmen, Dr. Harold I. Lief or Prof. Forrest E. LaViolette, Ph.D., Tulane University.)

MARYLAND

Visiting Lecturer.—Prof. Curt Stern, Ph.D., of the University of California, Berkeley, will be visiting lecturer in medicine at the Johns Hopkins Hospital, Baltimore, during the month of January, 1959. During this time he will give a series of 12 lectures entitled "A Survey of Human Genetics."

MASSACHUSETTS

Mueller Memorial Lecture.—Joshua Lederberg, Ph.D., one of three American scientists to share the 1958 Nobel prize in medicine and physiology, delivered the second annual J. Howard Mueller Memorial Lecture at the Harvard Medical School, Boston, Nov. 13 on "Genes and Antibodies: Genetic Models of Immunity and Differentiation." The lecture honors Dr. Mueller who at the time of his death in 1954 was Charles Wilder Professor of Bacteriology and Immunology at Harvard. W. E. Van Heyningen, of Oxford University, England, delivered the first Mueller Memorial Lecture in April, 1958.

Seminar on Medical Education.—The department of medical education at Beverly Hospital, Beverly, has announced a Seminar on Medical Education for the non-university hospitals of New England to be held Jan. 9-10 with Drs. Alexander M. Burgess, Providence, R. I., and John C. Leonard, Hartford, Conn., as co-chairmen. A symposium, "Considerations in the Maintenance of an Effective Teaching Program in the Non-University Hospital," will be moderated by Dr. Leonard, 3:15 p. m., Jan. 9. Other topics and participants are as follows:

Aims and Objectives of the American Association of Directors of Medical Education, Dr. William J. Lahey, Hartford, Conn.
The Community Teaching Hospital in Graduate Medical Education, Dr. Jean A. Curran, Boston.
Report from the Educational Council for Foreign Medical Graduates, Dr. Dean F. Smiley, Evanston, Ill.
The Future of the Non-University Hospitals in New England, Dr. John C. Nunemaker, Washington, D. C.

For information write Dr. Philip D. Herrick, Director of Medical Education, Beverly Hospital, Beverly, Mass.

MICHIGAN

Births Decline.—During the first eight months of this year 2,436 fewer babies were born in Michigan than during the comparable period of 1957, the Michigan Department of Health reports. Birth registrations during the initial two-thirds of 1958 totaled 129,172, as against 131,608 in the first eight months of last year. Births for 1958 exceeded 1957 monthly totals for the first five months of this year, but June, July, and August births totaled 891, 1,145, and 787 under the same months of last year. State health department records show that in 1957 births ran behind the previous year for the first four months but then rallied sharply and set an all-time 12-month record of 207,308.

NEW JERSEY

Aging Division and Senior Center Established.—As a result of a study of its 150-member citizens committee, the Bergen County Tuberculosis and Health Association of New Jersey has established a Division of the Aging and opened a Senior Center, which will offer both an activity program and a specialized guidance and referral service. The division will plan additional projects and work to stimulate public interest and activity in further aspects of aging, such as preparation for retirement, housing, facilities for the chronically ill, etc. For information, write to the association at 369 Union St., Hackensack, N. J.

NEW YORK

Dr. Moe Honored.—Dr. Gordon K. Moe, chairman, department of physiology, State University Upstate Medical Center in Syracuse, received the University of Minnesota's outstanding achievement award Sept. 29. The award was given at the university's Medical Foundation Day exercises. Dr. Moe has been chairman of the physiology department of the Upstate Medical Center since 1950. He previously was on the faculties of Harvard Medical School and the University of Michigan Medical School, Ann Arbor. Dr. Moe received a traveling fellowship from the American Physiology Society for study at Oxford in 1947, and was a visiting scientist at Sandoz Laboratories, Basel, Switzerland, in 1949. In 1951 he served on a medical teaching mission of the Unitarian Service Committee and World Health Organization to Israel and Iran.

New York City

Bronx Hospital Expands Facilities.—A $350,000 project involving the installation of a postoperative recovery unit and expansion of the operating theater and the x-ray department has been completed by the Bronx Hospital, Dr. Aaron A. Karan, hospital director, has announced. The remodeled, air-conditioned, and expanded operating theater will facilitate the surgical management of the increase in the number of formidable procedures performed at the hospital. In 1957 more than 5,500 operations were performed at the hospital.

Eightieth Birthday Celebration.—A meeting sponsored by the Association for the Advancement of Psychoanalysis in honor of Dr. Kurt Goldstein's 80th birthday was held at the New York Academy of Medicine, Oct. 22. Speakers at the meeting were: Dr. Harold Kelman, speaking on "Kurt Goldstein's Influence on Psychoanalytic Thought"; Dr. Lawrence S. Kubie, on "A Reexamination of the Concepts of Conscious, Preconscious and Unconscious Functions"; Rollo R. May, Ph.D., on "Kurt Goldstein and Concepts of Creativity," and Dr. Frederick A. Weiss, on "Kurt Goldstein and His Concept of Human Nature."

Advisory Board for Institute of Nutrition.—Former President Herbert Hoover has accepted the post of honorary chairman of the new advisory board of the Institute of Nutrition Sciences at Columbia University. Mr. Hoover opened the first meeting of the advisory board Oct. 1. The meeting of the board marks the activation of plans for the Institute of

Nutrition Sciences, for which arrangements have been completed and which was created at Columbia to meet the need for properly trained experts to combat problems of nutrition. The plans include cooperative activity with institutions in foreign countries. Institute headquarters are at Columbia-Presbyterian Medical Center, in the School of Public Health. The facilities of Columbia's graduate schools and institutes have been made available for teaching and research.

OREGON

Dr. Dunphy Appointed Surgical Department Chairman.—Dr. John E. Dunphy has been appointed professor and chairman of the department of surgery at the University of Oregon Medical School, Portland. He will take up his new duties after the first of the new year. Currently professor of surgery at Harvard Medical School, Boston, Dr. Dunphy also is director of the Harvard Surgical Service and the Sears Laboratory at Boston City Hospital. He will assume the position vacated a year ago by Dr. William K. Livingston, who retired to a part-time position in surgery after serving as professor and departmental chairman for more than a decade. Named professor of surgery at Harvard in 1955, Dr. Dunphy serves on the editorial boards of the *New England Journal of Medicine*, the *Annals of Surgery*, and the *American Journal of Surgery*.

PENNSYLVANIA

Meeting on Rehabilitation.—The Pennsylvania Academy of Physical Medicine and Rehabilitation will meet at the Harrisburg Hospital, Harrisburg, at 1:00 p. m., Jan. 17. The program will be as follows:

Management of Low Back Problems, Dr. George A. Berkheimer, chief of the orthopedic department of Harrisburg Hospital.
Management of the Paraplegic, Dr. Robert L. Harding, head, department of plastic surgery.
Rehabilitation of the Lower Extremity Amputee, Dr. Allen S. Russek, director, Physical Medicine and Rehabilitation Hospital for Joint Diseases, New York City.
Management of Cervical Problems, Dr. Nathan Sussman, chief Arthritis Clinic and head department of physical medicine and rehabilitation of the Harrisburg Hospital.
Physical Treatment of Shoulder Lesions, Dr. William H. Schmidt, head department of physical medicine and rehabilitation, Jefferson Medical College, Philadelphia.

For information write Dr. Joseph M. Johnston, Secretary-Treasurer, Pennsylvania Academy of Physical Medicine and Rehabilitation, 694 Washington Road, Pittsburgh 28.

Philadelphia

Dr. Ravdin Receives Lovelace Award.—Dr. Isidor S. Ravdin, vice-president for medical development, University of Pennsylvania, and John Rhea Barton professor of surgery, was named to receive the first annual Lovelace Foundation award in a ceremony in Albuquerque, N. M., Nov. 18. According to Dr. Burgess L. Gordon, executive secretary of the foundation, and formerly president of Women's Medical College in Philadelphia, the award will go each year to the nation's "most outstanding medical figure" as selected by the foundation's board of directors.

PUERTO RICO

Physicians Meeting in Santurce.—The American College of Physicians eighth regional meeting will be held Dec. 19-20 at the Puerto Rico Medical Association Building, Santurce, Puerto Rico. Presiding at the opening sessions will be Dr. F. Hernandez-Morales, governor of the college for Puerto Rico. Of the 17 papers scheduled, the following will be included in the first session: "Recent Developments in the Diagnosis of Hyperparathyroidism" and "Angina Pectoris and Its Gastrointestinal Interrelationships," by Major Milton E. Rubini, M. C., U. S. Army and Dr. Henry L. Bockus, Philadelphia, respectively. Guest speaker and official representative of the college at the noon luncheon, Dec. 20, will be Dr. Robert Wilson, Charleston, S. C., regent of the college. For information write the American College of Physicians, 4200 Pine St., Philadelphia 4.

WEST VIRGINIA

Dr. Laird Receives Surgeons' Award.—Dr. William R. Laird, of Montgomery, received the Distinguished Service Award of the American College of Surgeons during the annual meeting of the clinical congress in Chicago, Oct. 6-10. Dr. Laird has served as West Virginia governor of the American College of Surgeons, and is a diplomate of the American Board of Surgery. He is currently chairman of the visiting committee of West Virginia University School of Medicine, Morgantown. Dr. Laird is also president of the board of trustees of the Laird Foundation, a director of Education Foundation, Inc., and trustee of the Daywood Art Gallery in Lewisburg.

Personal.—Dr. Margaret T. Ross, of Beckley, has been appointed director of the Division of Community Services of the State Department of Mental Health. Dr. Ross has been serving as chief of psychiatry at Beckley Memorial Hospital since it opened in December, 1955.——Dr. John W. Lane, of Middletown, Conn., has been named acting superintendent of the Spencer State Hospital, Spencer, to succeed Dr. Isaac C. East, who has accepted appointment as staff psychiatrist at the Mississippi State Hospital at Whitfield.——At the annual meeting of the West Virginia Heart Association, Oct. 10, Dr. James H. Wolverton Jr., of Piedmont, was elected president and Dr. Jesse J. Jenkins Jr., of Fairmont, president-elect.

GENERAL

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Nov. 15, 1958		Nov. 16, 1957
	Paralytic Type	Total Cases	Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	1	1	..
Rhode Island	..	..	..
Connecticut	..	..	..
Middle Atlantic States			
New York	6	8	..
New Jersey	..	1	..
Pennsylvania	4	6	1
East North Central States			
Ohio	6	17	..
Indiana	3	4	2
Illinois	2	3	..
Michigan	7	18	5
Wisconsin	2	3	..
West North Central States			
Minnesota	2	2	..
Iowa	1	1	1
Missouri	7	8	3
North Dakota	..	..	..
South Dakota	..	1	1
Nebraska	1	4	1
Kansas	..	..	..
South Atlantic States			
Delaware	1	1	..
Maryland	2	4	..
District of Columbia	..	..	1
Virginia	4	5	..
West Virginia	6	12	2
North Carolina	1	1	1
South Carolina	1	1	..
Georgia	2	2	2
Florida	1	1	3
East South Central States			
Kentucky	6	6	3
Tennessee	2	4	..
Alabama	5	6	3
Mississippi	..	..	2
West South Central States			
Arkansas	2	2	..
Louisiana	..	..	2
Oklahoma	..	..	1
Texas	19	23	4
Mountain States			
Montana	..	1	..
Idaho	..	..	..
Wyoming	..	2	..
Colorado	1	1	2
New Mexico	..	1	1
Arizona	..	..	..
Utah	..	..	..
Nevada	..	..	..
Pacific States			
Washington	..	..	..
Oregon	..	..	1
California	11	12	5
Alaska	..	..	..
Hawaii	..	..	..
Puerto Rico	..	..	..
Total	106	162	47

Fellowships for Research in Blindness.—The National Council to Combat Blindness, Inc., has announced that it is now accepting applications for its 1959-1960 Fight For Sight grants-in-aid, research fellowships and summer (1959) student fellowships. The closing date for receipt of completed applications for grants and fellowships has been advanced to March 1, 1959, in order to allow time for processing and review. Applications for summer student fellowships will be reviewed in advance of the June meeting of the Scientific Advisory Committee. Appropriate forms may be obtained by addressing: Secretary, National Council to Combat Blindness, Inc., 41 W. 57th St., New York 19. Fight For Sight grants-in-aid and full-time research fellowships are generally awarded for a period of one year and may be extended for an additional period with the approval of the National Council to Combat Blindness' Scientific Advisory Committee, chaired by Dr. Charles A. Perera, associate clinical professor of ophthalmology, College of Physicians and Surgeons, Columbia University, New York City. The Scientific Advisory Committee, which votes on all awards, now numbers 18, having recently welcomed to its ranks a new member, Dr. Frank W. Newell, chairman of the section of ophthalmology, department of surgery, University of Chicago Medical School.

Meeting of Surgeons in Miami Beach.—Nearly 100 surgeons from 19 states and three foreign countries, including instructors from 18 medical schools, will present the scientific program at the Southeastern Regional Meeting of the U. S. Section, International College of Surgeons, in Miami Beach, Fla., Jan. 4-7. Sessions will be held in the Americana Hotel. The first day a cinema program will be presented under the direction of Drs. Philip Thorek and Jerome J. Moses, Chicago. Starting Jan. 5, 12 surgical specialties will hold breakfast discussions, with a question-and-answer period for an hour. These will be followed by a general surgery program, with a break for viewing scientific exhibits. Specialty group meetings will be held Monday and Tuesday afternoons. Smith, Kline & French, Philadelphia, will televise operations in color in the mornings from St. Francis Hospital, Miami Beach, to the Americana Hotel. A panel for general practitioners on Tuesday morning has been accorded category I credit by the American Academy of General Practice and will deal with the management of surgical emergencies, with Dr. Ross T. McIntire, Chicago, executive director of the International College of Surgeons, as moderator. Dr. Louis M. Orr of Orlando, Fla., President-Elect of the American Medical Association, will be the banquet speaker the evening of Jan. 6. There will be a $10 registration fee for members of the college and $5 for members of the American Academy of General Practice. Guests, interns, residents, and nurses will be admitted free. Information may be obtained from Dr. Harold O. Hallstrand, general chairman, 7210 Red Road, South Miami, Fla.

Foreign Speakers on Lecture Program.—Dr. Macdonald Critchley, of the National Hospital for Nervous Diseases, London, England, delivered the first Squibb centennial lecture in this country at the Medical College of Virginia, Richmond, Oct. 1 on "Language Disorders—Past, Present and Future." The Squibb Company is sponsoring the appearance in the United States of eight foreign scientists. Additionally, eight outstanding American scientists are included in the program. Other scientists from outside the United States who will deliver Squibb centennial lectures include: Dr. John F. Brock, University of Cape Town, South Africa; Dr. J. F. Danielli, professor of zoology, University of London, England; Dr. J. C. Eccles, Australian National University, Canberra, A. C. T.: Dr. J. H. Gaddum, Edinburgh University, Scotland; Dr. Luis F. Leloir, Biochemistry Research Institute, Buenos Aires, Argentina; Dr. A. Luoff, Institute Pasteur, Paris, France; and Dr. F. Lynen, Max Planck Institute for Cell Chemistry, Munich, Germany.

Medical Record Consultants.—At the annual meeting of the Association of Medical Record Consultants at Boston Oct. 17, Mr. Stephen S. Henkin, medical record consultant of the Health Insurance Plan of Greater New York, was reelected president and Adaline C. Hayden, Associate Editor of Standard Nomenclature of Diseases and Operations, American Medical Association, was reelected secretary-treasurer. The association arranged for its first scientific assembly to be held in Chicago in January, 1960. The meeting will be open to anyone interested in the consulting phases of medical record library science. The association also established a nominee membership to develop educational opportunities in the field of medical record library consultation.

Foundation Grants for Research.—Research Corporation, a nonprofit foundation, distributed as grants-in-aid during fiscal 1958, ended Oct. 31, a total of $1,244,000. The last quarter grants were made among four areas of the foundation's interests:

Frederick Gardner Cottrell Grants—$146,908 granted to 46 colleges and universities in 24 states and to the American University of Beirut for basic research in the natural sciences.

The Williams–Waterman Fund for the Combat of Dietary Diseases—$68,260 granted to universities both in the U. S. and abroad for basic research and experimental programs related to the field of human nutrition.

The Brown–Hazen Fund—$4,700 granted to Baylor University, concerns itself with fundamental research in biochemistry, microbiology, and immunology.

Howard Andrews Poillon Fund—$39,391 granted to four universities in the U. S. for programs of "exceptional scientific merit" which fall outside the scope of the major funds.

Research Corporation was established in 1912 by the late inventor-scientist Frederick Gardner Cottrell, who was professor of chemistry at the University of California. The foundation supports research in the natural sciences in educational and scientific institutions.

Award for Rehabilitation Study.—The World Rehabilitation Fund has created the Arde Bulova Memorial Fellowship in Rehabilitation and the first recipient of the award is to be Dr. Alois Bruegger of Basel, Switzerland. Dr. Bruegger will come to New York in January, 1959, for a six months' course in rehabilitation of paraplegic patients at the Institute of Physical Medicine and Rehabilitation, New York University–Bellevue Medical Center. On completion of his training, Dr. Bruegger, a neurosurgeon, will be the medical director of a special paraplegia unit in the rehabilitation center at the Basel University Hospital. Dr. Howard A. Rusk is president of the World Rehabilitation Fund. The late Mr. Bulova was chairman of the Employer's Subcommittee of the President's Committee on Employment of the Physically Handicapped. The World Rehabilitation Fund is a voluntary agency supported by American industry to help other nations develop rehabilitation services for their physically handicapped.

Commissioners Review Mental Health Programs.—The commissioners who direct the state mental health and hospital programs of 29 states met in Kansas City, Mo., in October, under the auspices of the American Psychiatric Association, to review and analyze trends in these programs and the fiscal and administrative problems underlying them. It was the first time that the commissioners, or those who function as such, had met together as a national group. The commissioners authorized release of a statement which read in part as follows:

> The 49 states are now spending over a billion dollars annually for the operation and construction of mental hospitals. In recent years the results of these heavier expenditures in personnel, in research, and in training are increasingly visible in better patient-staff ratios in the mental hospitals, in decreasing hospital populations despite the highest admission rates in history, and in the greatest number of discharges ever witnessed.
>
> The commissioners are well aware of the pressures upon limited financial resources in the states . . . and of their responsibility for indicating the amount and priority of resources to be devoted to mental illness and health—a problem responsible for the occupancy of half of the total hospital beds of the nation, and affecting at least one in every 10 persons at some point during their lifetime. They are aware that the cost of mental illness to the nation in terms of employment lost and direct expenditures is over $2,500,000,000 a year.
>
> The commissioners have reviewed mental health needs in the light of current trends. . . .
>
> The commissioners affirm their belief that potential advances are magnificently promising and that *NOW* is the time to invest heavily in state mental health and hospital programs. If this is done, it will accelerate a movement which, in the foreseeable future, may be expected to minimize tremendous costs in capital outlays for mental hospital construction and add greatly to the productive potential of the nation.

The commissioners also recorded their intention of organizing as a permanent group to meet regularly to exchange information about their programs and how they may be further advanced. The group at Kansas City designated themselves as a Committee of the Whole pending formal organization. An executive committee was formed to work out the details of organization with Dr. George W. Jackson, Topeka, Kan., as chairman. Commissioners who were not present in Kansas City will be invited to participate in the new organization.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least *six* weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications was Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Written.* Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

ALASKA:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

ARIZONA:* *Written Examination and Reciprocity.* Phoenix, Jan. 14-16. Sec., Dr. Thomas H. Bate, 2910 North 7th Ave., Phoenix.

CONNECTICUT:* *Homeopathic. Examination.* Derby, Jan. 13. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Written Examination and Endorsement.* Dover, Jan. 13-15, Jan. 22. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

GEORGIA: *Examination and Reciprocity.* Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

GUAM: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

HAWAII: *Examination.* Honolulu, Jan. 12-13. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: *Examination and Endorsement.* Boise, Jan. 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: *Examination and Reciprocity.* Chicago, Jan. 26-30. Supt. of Registration, Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

MASSACHUSETTS: *Examination.* Boston, Jan. 13-16. Sec., Dr. Robert C. Cochrane, State House, Room 37, Boston 33.

MINNESOTA:* *Examination.* Minneapolis, Jan. 20-22. *Reciprocity.* St. Paul, February. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul.

MISSOURI: *Examination.* Kansas City, Jan. 9-10. Exec. Sec., Mr. John A. Hailey, Box ???, Jefferson City.

MONTANA: *Examination and Reciprocity.* Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

NEBRASKA:* *Examination.* Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEW HAMPSHIRE: *Examination and Endorsement.* Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

NORTH CAROLINA: *Reciprocity.* Southern Pines, Jan. 17. *Examination.* June. Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: *Examination and Reciprocity.* Grand Forks, Jan. 7-10. Sec., Dr. C. J. Glaspel, Grafton.

OKLAHOMA:* *Examination.* Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Examination.* Portland, Jan. 6-7. *Reciprocity.* Portland, Jan. 8-10. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

PENNSYLVANIA: *Examination.* Philadelphia, Jan. 7-10. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

RHODE ISLAND:* *Examination.* Providence, Jan. 8-9. Admin., Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA:* *Examination.* Sioux Falls, Jan. 20-21. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

UTAH: *Examination.* Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

WASHINGTON:* *Examination.* Seattle, Jan. 12-14. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

WEST VIRGINIA: *Examination and Reciprocity.* Charleston, Jan. 5-7. Sec., Dr. Newman H. Dyer, State Office Bldg. No. 3, Charleston 5.

WISCONSIN:* *Examination and Reciprocity.* Madison, Jan. 13-15. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., 1 West Wilson St., Madison.

WYOMING: *Examination and Reciprocity.* Cheyenne, Feb. 2. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination.* Little Rock, May 4-5. Sec., Dr. S. C. Dellinger, University of Arkansas, Fayetteville.

CONNECTICUT: *Examination.* New Haven, Feb. 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

FLORIDA: *Examination.* Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

IOWA: *Examination.* Des Moines, Jan. 13. Sec., Dr. Elmer W. Hertel, Wartburg College, Waverly.

KANSAS: *Endorsement.* Kansas City, Jan. 14. *Examination.* Kansas City, Jan. 16-17. Sec., State Board of Healing Arts, Dr. F. J. Nash, New Brotherhood Bldg., Kansas City.

MICHIGAN: *Examination.* Ann Arbor and Detroit, Feb. 12-13. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., West Michigan Ave., Lansing.

MINNESOTA: *Examination.* Minneapolis, Jan. 6-7. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

NEW MEXICO: *Examination.* Santa Fe, Jan. 18. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

OKLAHOMA: *Examination.* Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

TENNESSEE: *Examination.* Memphis, Dec. 31-Jan. 1. Sec., Dr. O. W. Hyman, 62 South Dunlap St., Memphis 3.

TEXAS: *Examination.* April 1959. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WASHINGTON: *Examination.* Seattle, Jan. 7-8. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

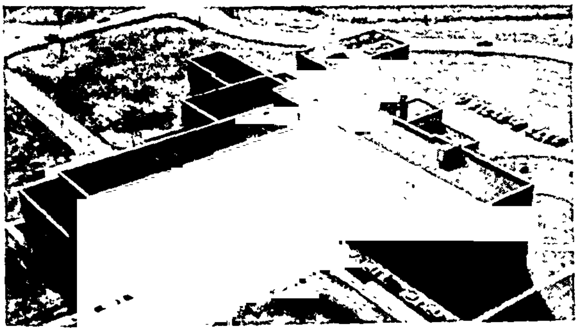
---

*Basic Science Certificate required.

GOVERNMENT SERVICES

AIR FORCE

New Hospital.—The United States Air Force Hospital at Andrews Air Force Base, Washington, D. C., was formally dedicated on Nov. 7. Major Gen. Olin F. McIlnay, deputy surgeon general, in his dedicatory address, stated that this new facility symbolized the many advancements and improvements that have been made in military and clinical medicine. The hospital, which was opened on Aug. 4, has 250 beds located in nine wings. In addition, it can accommodate over 100 transient patients at one time as part of the U. S. A. F. aeromedical evacuation system. The Air Force Clinic, a group of specialty clinics designed to provide examination and treatment of patients on an appointment basis, is staffed and equipped to see about 800 persons daily. A five-story, air-conditioned, brick structure, the hospital has many modern systems including central oxygen distribution, vacuum suction, pneumatic tube message delivery, intercommunications in all clinics and ward areas, radio public address, an audiovisual nurse and doctor paging system, and closed circuit color television service for instruction in professional subjects. Col. Aubrey L. Jennings, M.C., U. S. Air Force, is commander of the hospital and surgeon of headquarters command.



New hospital, Andrews Air Force Base.

Consultants Visit Medical Installations.—Drs. Arthur W. Proetz and Theodore E. Sanders, consultants to the Air Force surgeon general recently visited Air Force medical installations in Germany, France, England, Spain, Libya, and Morocco. Dr. Proetz of St. Louis is a consultant in otolaryngology and Dr. Sanders also of St. Louis is a consultant in ophthalmology. In line with the surgeon general's policy, they advised on problem cases in their respective specialties and conducted lectures and teaching sessions at medical installations.

VETERANS ADMINISTRATION

Hospital News.—Dr. Oskar Diethelm, professor of psychiatry, Cornell University Medical College, addressed the Suffolk County District Branch of the American Psychiatric Association and the staff of the Veterans Administration Hospital, Northport, N. Y., Oct. 28, on "Thyroid Studies in Psychopathologic Disorders."

Dr. Jackson A. Smith, associate director for research, Nebraska Psychiatric Institute, University of Nebraska College of Medicine, Omaha, addressed the staff on Nov. 3, at the VA Hospital, Jefferson Barracks, Mo., on "Lost Tranquility: A Persisting Epidemic."

Dr. Joseph Hirsh, associate professor, Albert Einstein College of Medicine, addressed the staff of the VA Hospital, Northport, New York, Sept. 22, on "The Dimensions and Dynamics of Alcoholism."

PUBLIC HEALTH SERVICE

Water Pollution Report.—A report on the water pollution control program for the fiscal years 1957 and 1958 covering all phases of the program—construction of sewage treatment plants, interstate enforcement activities, research and basic data analyses, and the need for increased public awareness of the water pollution problem—is now available. It may be obtained from the Water Pollution Control Program of the Public Health Service in Washington, or from Regional Engineers in the following cities:

Region 1 and 2, Room 1200, 42 Broadway, New York 4; Region 3, 700 E. Jefferson St., Charlottesville, Va.; Region 4, Room 164, 50 Seventh St. N. E., Atlanta 23, Ga.; Region 5, Room 200, 69 W. Washington St., Chicago 2; Region 6, 2305 Federal Office Bldg., 911 Walnut St., Kansas City 6, Mo.; Region 7, Ninth Floor, 1114 Commerce St., Dallas 2, Texas; Region 8, Room 551, 621 17th St., Denver 2; Region 9, 447 Federal Office Bldg., Civic Center, San Francisco 2.

Personal.—Dr. H. van Zile Hyde has been appointed assistant to the surgeon general for international health. Dr. Hyde, who entered public health as a full-time career in 1941, was active in the United States preparations for the formation of the World Health Organization 10 years ago. He has served as chairman of the WHO Executive Board and on the directing council of the Pan American Sanitary Organization.

DEATHS

Adams, Warren Sanford, New York City; Bellevue Hospital Medical College, New York City, 1897; died Oct. 20, aged 95.

Agnew, Lloyd Campbell Ⓜ Lynchburg, Va.; born in Charleston, S. C., Jan. 9, 1916; Medical College of South Carolina, Charleston, 1939; specialist certified by the American Board of Anesthesiology; member of the American Society of Anesthesiologists and the Lynchburg Academy of Medicine; veteran of World War II; interned at the University Hospitals in Iowa City, Iowa, where he served a residency; served a residency at the Joseph H. Pratt Diagnostic Hospital in Boston and the Georgetown University Hospital in Washington, D. C.; associated with the Lynchburg General Hospital and the Virginia Baptist Hospital; died in the University of Virginia Hospital in Charlottesville Oct. 8, aged 42.

Aronson, Joseph David, Philadelphia; born in Russia Jan. 12, 1887; Medico-Chirurgical College of Philadelphia, 1908; professor of bacteriology at the Henry Phipps Institute of the University of Pennsylvania; at one time professor of pathology at the University of Arkansas School of Medicine in Little Rock; specialist certified by the American Board of Pathology; member of the American Association of Pathologists and Bacteriologists, American Society for Experimental Pathology, American Association of Immunologists, American Association for the Advancement of Science, and the American Trudeau Society; in 1935 was appointed special expert on tuberculosis in the Indian Service under the U. S. Department of Interior and in 1950 was presented with its Distinguished Service Award for his work in connection with control of tuberculosis among American Indians; in recognition of his studies on the evaluation of BCG vaccine in the control of tuberculosis, the College of Physicians of Philadelphia on July 14, 1947, awarded him the Alvarenga Prize; veteran of World Wars I and II; aged 71; died Oct. 17 of coronary heart disease, in Paramaribo, Surinam, Dutch Guiana, where he went to study leprosy.

Barber, John Raymond, Santa Cruz, Calif.; Rush Medical College, Chicago, 1902; served in the regular Army; veteran of World War I; died Sept. 21, aged 80, of heart disease.

Barnes, Lewis Chesley, Hamburg, Ark.; University of Tennessee College of Medicine, Memphis, 1912; past-president and secretary of the Ashley County Medical Society; served as medical examiner for the Ashley County Draft Board during World Wars I and II; city and county health officer; died in the Lake Village (Ark.) Infirmary Oct. 4, aged 72, of coronary thrombosis.

Beisbarth, Albert Ⓜ St. Louis; Beaumont Hospital Medical College, St. Louis, 1899; associated with St. Anthony's and St. Mary's hospitals; died in St. Luke's Hospital Oct. 16, aged 80, of coronary thrombosis.

Beringer, Lester Eastwood Ⓜ Colorado Springs, Colo.; Marquette University School of Medicine, Milwaukee, 1915; service member of the American Medical Association; fellow of the American College of Surgeons; entered the medical corps of the U. S. Army in 1920; veteran of World Wars I and II; retired Aug. 31, 1951; died in U. S. Army Hospital, Fort Carson, aged 67, Aug. 23, of acute pulmonary edema due to myocardial infarction and arteriosclerotic heart disease.

Berman, Joseph Ⓜ Brooklyn; Long Island College Hospital, Brooklyn, 1927; died in the Evangelical Deaconess Hospital Sept. 25, aged 55, of acute coronary occlusion.

Bishop, Vernon Leslie, Rochester, N. Y.; University of Buffalo School of Medicine, 1907; life fellow of the Rochester Academy of Medicine; specialist certified by the American Board of Otolaryngology; veteran of World War I; on the staff of the Highland Hospital; died Oct. 5, aged 74.

Bonar, Everett Twinem Ⓜ La Jolla, Calif.; Ohio State University College of Medicine, Columbus, 1920; member of the Ohio State Medical Association; for many years practiced in Columbus, Ohio, where he was on the staffs of St. Anthony and White Cross hospitals; died Sept. 28, aged 65.

Bouslough, Elmer E., Aurora, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1893; died in the Galena Boulevard Hospital July 21, aged 94.

Brown, Alfred, Chicago; Atlanta College of Physicians and Surgeons, 1912; died in Evergreen Park, Ill., July 6, aged 76.

Campbell, William Ⓜ Jackson Heights, N. Y.; Long Island College Hospital, Brooklyn, 1909; affiliated with Flushing (N. Y.) Hospital and Dispensary; died Sept. 28, aged 79, of arteriosclerotic heart disease.

Cipriani, John Baptist, Des Plaines, Ill.; University of Illinois College of Medicine, Chicago, 1913; at one time on the faculty of his alma mater; served as managing officer of the Illinois Eye and Ear

---

Ⓜ Indicates Member of the American Medical Association.

Infirmary in Chicago; formerly on the staffs of West Suburban Hospital in Oak Park, and St. Elizabeth Hospital, St. Anne's Hospital, and Mother Cabrini Hospital in Chicago, where he was first president from 1927 to 1933; associated with the old Chicago Surface Lines and continued as a physician with Chicago Transit Authority's medical department; died in the Chicago Wesley Memorial Hospital Oct. 20, aged 67.

Condon, John Joseph, Chicago; Northwestern University Medical School, Chicago, 1911; veteran of World War I; formerly practiced in Bloomington, where he was on the staff of St. Joseph Hospital; died in St. Joseph Hospital Oct. 13, aged 69, of carcinoma of the lung.

Cousins, Sidney Charles Ⓢ Washington, D. C.; George Washington University School of Medicine, Washington, 1916; served in France during World War I; associated with Doctors, Georgetown, George Washington University, Providence, and District of Columbia General hospitals and Suburban Hospital, Bethesda, Md.; died in San Francisco Oct. 11, aged 65, of coronary occlusion.

Donnelly, Edward John Ⓢ Philadelphia; Jefferson Medical College of Philadelphia, 1931; assistant professor of clinical ophthalmology at his alma mater; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the International College of Surgeons and the American College of Surgeons; on the staffs of the Philadelphia General Hospital and St. Vincent's Hospital for Women and Children, and the Wills Eye Hospital, where he died Oct. 11, aged 52, of coronary occlusion.

Dougherty, Edward Francis, St. Petersburg, Fla.; Tufts College Medical School, Boston, 1924; veteran of World War I; interned at Rhode Island Hospital in Providence, R. I., where for many years he practiced and where he was chief of staff at St. Joseph's Hospital; retired from the Veterans Administration March 31, 1955; died in St. Anthony's Hospital Oct. 2, aged 64, of acute myocardial infarction.

Elder, Eugene E. Ⓢ Youngstown, Ohio; born March 22, 1890; Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest, Hungary, 1922; member of the American Psychiatric Association; superintendent of the Woodside Receiving Hospital; for six years assistant superintendent of the Massillon (Ohio) State Hospital; served with the Austrian troops and was captured by the Russians; in 1917 was transferred to Siberia, where he remained four years, serving as prison camp physician; came to America from Budapest in 1924; died in St. Francis Hospital, Miami Beach, Fla., Oct. 2, aged 68, of myocardial infarction and generalized arteriosclerosis.

Hitchins, Clayton Stanley Ⓢ New Haven, Conn.; Cornell University Medical College, New York City, 1938; assistant clinical professor of obstetrics and gynecology at Yale University School of Medicine; specialist certified by the American Board of Obstetrics and Gynecology; attending obstetrician and gynecologist at Grace–New Haven Community Hospital, where he died Oct. 14, aged 46, of carcinoma of the testis with metastases.

Iliff, Frances Jessie, Cincinnati; Laura Memorial Woman's Medical College, Cincinnati, 1897; died in the Emerson A. North Hospital July 15, aged 84.

Johnson, Frank Ⓢ Eldorado, Ill.; Barnes Medical College, St. Louis, 1902; died in Galatia July 18, aged 86.

Ketchersid, John Wesley, Albuquerque, N. M.; Vanderbilt University School of Medicine, Nashville, Tenn., 1898; died in Las Vegas, Sept. 28, aged 80.

Klotz, Fred Guth Ⓢ Allentown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1911; fellow of the American College of Surgeons; past-president of the Lehigh County Medical Society; on the staff of the Allentown General Hospital; for many years physician for the Lehigh County Prison; died Sept. 27, aged 71, of pulmonary edema and arteriosclerotic heart disease.

Kvitek, Louis Charles Ⓢ Hinsdale, Ill.; Chicago College of Medicine and Surgery, 1916; died Oct. 11, aged 67.

Lipschutz, Sigmund W. Ⓢ Brooklyn; New York Homeopathic Medical College and Flower Hospital, New York City, 1921; died Sept. 12, aged 61, of acute coronary thrombosis.

McCarthy, Daniel Joseph, Philadelphia; born in Philadelphia June 22, 1874; University of Pennsylvania Department of Medicine, Philadelphia, 1895; served as professor of medical jurisprudence at his alma mater and the Woman's Medical College of Pennsylvania; an associate member of the American Medical Association; fellow of the American College of Physicians; member and past-president of the American Neurological Association and the Philadelphia Neurological Association; member of the American Psychiatric Association; a founder of the National Tuberculosis Association; named director of the Medical Department of Municipal Court in 1935 and in 1942 became director of probation, serving until 1948; veteran of World War I; a neurologist with the Army of Occupation in Germany; was in charge of the neurologic foundation at Temple University which was created for the study and treatment of nervous conditions arising from modern living conditions; served as chairman of the State Council of the Mental Hygiene Division of the Public Charities Association of Pennsylvania; in 1950 elected chancellor of

Florida Southern College, Lakeland, which in 1951 awarded him the degree of doctor of laws; in 1954 Dr. McCarthy was awarded the "Distinguished Service Cross" by Palm Beach County Tuberculosis and Health Association, Inc., for his many contributions to the tuberculosis program over 50 years; consultant, State Hospital at Norristown, Pa.; consulting neurologist at Philadelphia General Hospital and St. Agnes Hospital; editor of "Medical Treatment of Mental Diseases"; died in Ventnor, N. J., Oct. 9, aged 84.

Muhly, Edward George Ⓜ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1900; professor emeritus of histology at his alma mater; died in the Hahnemann Hospital Oct. 10, aged 80, of congestive heart failure, uremia, and myocardial infarction.

Onesti, Silvio Joseph Ⓜ San Francisco; Medical Department of the University of California, San Francisco, 1899; died Oct. 5, aged 83, of arteriosclerotic heart disease.

Platt, Marden Henry, Riverside, R. I.; University of Vermont College of Medicine, Burlington, 1910; during World Wars I and II served on the Selective Service Board of Providence County number 2; associated with the Memorial Hospital in Pawtucket; died Sept. 28, aged 72, of heart disease.

Rhodes, Goodrich Barbour, Cazenovia, N. Y.; Columbia University College of Physicians and Surgeons, New York City, 1902; member of the founders group of the American Board of Surgery; member of the Southern Surgical Association; fellow of the American College of Surgeons; veteran of World War I; formerly associated with the U. S. Public Health Service; at one time practiced in Cincinnati, where he was on the staff of the Cincinnati General Hospital; died Oct. 5, aged 82, of chronic arteriosclerotic myocarditis.

Ross, Lucretius Henry Ⓜ Bennington, Vt.; Harvard Medical School, Boston, 1898; president of the Bennington Water Board; in 1955 published a book on birds; on the staff of the Putnam Memorial Hospital, where he died Oct. 10, aged 91.

Russell, Claude Vernard Ⓜ Lansing, Mich.; Rush Medical College, Chicago, 1906; past-president of the Ingham County Medical Society; chief of staff. Edward W. Sparrow and St. Lawrence hospitals; charter member of the Lansing Rotary Club; died Sept. 25, aged 77, of acute coronary occlusion and diabetes mellitus.

Sanders, Leighton Albert, Durham, N. H.; University of Vermont College of Medicine, Burlington, 1932; resident physician at the Hood Infirmary at the University of New Hampshire; died in the New Hampshire State Hospital, Concord, Sept. 24, aged 51, of acute asthma (asphyxia), hypertension, and chronic nephritis.

Sanders, Lewis Jackson, Fort Necessity, La.; College of Physicians and Surgeons, Memphis, Tenn, 1911; died in Monroe Sept. 22, aged 92, of cerebrovascular accident.

Schaller, George Jacob, Fort Lauderdale, Fla.; Michigan College of Medicine and Surgery, Detroit, 1897; veteran of World War I; died in Boston, Mich., July 23, aged 86, of coronary thrombosis.

Schmitt, Alexander Hunter, New York City; University and Bellevue Hospital Medical College, New York City, 1907; an associate member of the American Medical Association; fellow of the American College of Surgeons; served as president of the medical board of Misericordia Hospital, where he was a consultant; died Oct. 12, aged 74.

Seebert, Joseph Eldred, Lexington, Va.; Jefferson Medical College of Philadelphia, 1916; veteran of World War I; died in Stonewall Jackson Hospital Sept. 26, aged 66, of complications as the result of a fractured hip.

Smith, De Witt Talmage Ⓜ Gainesville, Fla.; University of Alabama School of Medicine, Mobile, 1907; served as a member of the city council; on the staff of the Alachua General Hospital, where he died Sept. 23, aged 77, of cerebral hemorrhage.

Smith, L. C., Henderson, Tenn.; Memphis (Tenn.) Hospital Medical College, 1902; died Sept. 25, aged 84, of bronchopneumonia.

Sparks, Francis Rufus Ⓜ Waverly, Iowa; Northwestern University Medical School, Chicago, 1904; fellow of the American College of Surgeons; past-president of the Bremer County Medical Society; veteran of World War I; a charter member and past-president of the Waverly Rotary Club; on the staff of St. Joseph's Mercy Hospital, where he died Oct. 2, aged 76, of cerebral thrombosis.

Spence, James Earle Hassard Ⓜ Hagerstown, Md.; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1923; served as resident surgeon for the Western Maryland Railway; died in the Washington County Hospital Sept. 27, aged 62, of coronary occlusion.

Stacey, Winthrop Downing, Melrose, Mass.; Tufts College Medical School, Boston, 1906; veteran of World War I; practiced in Boston; died in the New England Sanitarium and Hospital Sept. 14, aged 76, of arteriosclerotic heart disease.

Stasiunas, Juozas Joseph, Chicago; Imperial Military Medical Academy, St. Petersburg, Russia, 1917; interned at Roseland Community Hospital in Chicago; served as resident, State Hospital, Jamestown, N. D.; died in the Hospital of St. Anthony de Padua July 24, aged 64.

Stayton, Chester A., Sr. Ⓜ Indianapolis; born in Centerton, Ind., April 29, 1889; Indiana University School of Medicine, Indianapolis, 1915; formerly on the faculty of his alma mater; specialist certified by the American Board of Radiology; fellow of the American College of Radiology; member of the Radiological Society of North America, American Radium Society, and the Industrial Medical Association; served as secretary of the Indianapolis Medical Society; served as president and secretary-treasurer of the Indiana Roentgen Society; veteran of World War I; formerly associated with the U. S. Public Health Service Reserve; director of the Indiana Division of the American Cancer Society, of which he was National director; founder and formerly editor of the *Indianapolis Medical Society Bulletin;* associated with Witham Hospital, Lebanon, Ind., St. Francis Hospital, Beech Grove, and the Community Hospital and the Methodist Hospital, where he died Oct. 8, aged 69, of cerebral hemorrhage.

Stevenson, Arthur P. Ⓜ Torrance, Calif.; Ensworth Medical College, St. Joseph, Mo., 1907; on the staff of the Torrance Memorial Hospital, where he died Sept. 27, aged 73, of bronchogenic cancer.

Strickland, Harold Ⓜ Meriden, Conn.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1930; certified by the National Board of Medical Examiners; veteran of World Wars I and II; past-president of the local board of health; in 1948 vice-president of the Meriden Medical Society; associated with the Meriden Hospital and World War II Veterans Memorial Hospital; died Oct. 6, aged 60, of coronary thrombosis.

Stuck, Robert Gustavus Ⓜ Wolcott, N. Y.; Syracuse (N. Y.) University College of Medicine, 1924; past-president of the Wayne County Medical Society; member of the American Academy of General Practice; served as a member of the board of education and as health officer; veteran of World Wars I and II; charter member and past-president of Wolcott Rotary Club; on the staff of the Edward J. Barber Hospital in Lyons; founder and owner of the Wolcott Hospital, where he died Sept. 24, aged 59, of Hodgkin's disease.

Swanson, Harry Theodore Ⓜ Evanston, Ill.; Loyola University of Medicine, Chicago, 1916; member of the American Academy of General Practice; veteran of World War I; died in the Chicago Wesley Memorial Hospital Oct. 15, aged 69, of acute intrathoracic hemorrhage and bronchogenic cancer.

Taylor, Frank Bashford Ⓜ Madison, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; on the staffs of the Madison General and St. Mary's hospitals; died Sept. 25, aged 79, of arteriosclerosis.

Tenney, William Northend, Newton, Mass.; Harvard Medical School, Boston, 1895; served overseas during World War I; died in the Newton–Wellesley Hospital Sept. 10, aged 89, of cancer of the prostate and bronchopneumonia.

Terry, Philip Roy, Asheville, N. C.; George Washington University School of Medicine, Washington, D. C., 1907; coroner of Buncombe County; vice-president of the National Coroners' Association; at one time practiced in Washington, D. C.; served as county jail physician and prison camp physician; died Sept. 29, aged 78, of coronary occlusion.

Thomas, Henry S. Ⓜ Fort Washington, Pa.; born in Parker Ford, May 26, 1905; Temple University School of Medicine, Philadelphia, 1935; served as a command flight surgeon in the Army Air Force from 1941 to 1946 with the rank of lieutenant colonel; after release from active duty became medical director of Ciba Pharmaceutical Products, Inc., and later of Nepera Chemical Company; director of medical service, Merck Sharp & Dohme Research Laboratories, which he joined in 1951 as assistant medical director; member of the Aero Medical Association and the Association of Military Surgeons of the United States; died Oct. 9, aged 53, of coronary thrombosis.

Thompson, John Maurice Ⓜ Van Nuys, Calif.; born in St. Louis Dec. 3, 1911; University of Cincinnati College of Medicine, 1941; fellow of the American College of Surgeons; specialist certified by the American Board of Surgery; assistant clinical professor of surgery at the University of California School of Medicine at Los Angeles; veteran of World War II; awarded the Presidential Unit Citation and Combat Medal Badge; interned at Missouri Baptist Hospital in St. Louis; served a residency at Veterans Administration Center in Los Angeles; on the staffs of St. Joseph Hospital in Burbank and Presbyterian Hospital–Olmsted Memorial, Los Angeles; consultant, Veterans Administration Hospital in Sepulveda; on the staffs of Encino Hospital and West Valley Community Hospital in Encino, and the Valley Hospital; trustee and medical adviser on the board at Valley Presbyterian Hospital, where last March he was presented with a plaque in appreciation of work in organizing the hospital and where he died Oct. 3, aged 46, of bronchogenic carcinoma.

Tracy, George Thomas Ⓜ Beverly, N. J.; Jefferson Medical College of Philadelphia, 1898; past-president and secretary of the Burlington County Medical Society; member of the board of managers of the State Hospital in Trenton; died Oct. 2, aged 85.

Trankle, Herbert Milo, Chippewa Falls, Wis.; Rush Medical College, Chicago, 1901; formerly practiced in Bloomer, where he served on the city council and school board; served on the staff of Northern Wisconsin Colony and Training School; honorary staff member, St. Joseph's Hospital, where he died Sept. 21, aged 78, of coronary thrombosis and diabetes mellitus.

FOREIGN LETTERS

AUSTRIA

Unusual Types of Plasmocytoma.—At the meeting of the Society of Physicians in Vienna on Oct. 17, Drs. S. Wuketich and G. Siegmund briefly reviewed Schulten and Kanzow's classification of paraproteinemic reticulosis into three types, namely plasmocytoma, atypical macroglobulinemia, and Waldenström's macroglobulinemia. They reported a series of six patients with plasmocytoma examined at autopsy. Histological preparations revealed immature cellular plasmocytomas and neoplastic reticulosis with a plasmacytic differentiation. In only one case was an extramedullary generalization with infiltration of the lymph nodes present. Remarkable deviations could be detected by analyzing the serum proteins. The serum lability reaction (extremely shortened Weltmann coagulation band and negative thymol, cadmium, and distilled water reaction) showed an abnormal stability of the serum. Paper electrophoresis revealed paraprotein double bands lying close together in the beta area; partly a remarkable broad, very strong beta band which has a lighter boundary toward gamma, and a somewhat masked beta double band. Tiselius electrophoresis always shows a separation of the large beta myeloma gradient into two or three subfractions. With the aid of analytical ultracentrifugation, so-called atypical macroglobulins with sedimentation constants of 8 to 14 Svedberg units were found. The peculiar chemical albumin findings in the mentioned plasmocytoma types were considered as a new constellation in the reaction of the serum proteins, namely as a type of the beta-plasmocystoma with atypical macroglobulinemia.

Hormone Which Inactivates Oxytocin.—At the meeting of the society of physicians in Vienna on Oct. 24, Dr. W. Müller-Hartburg described a technique for chemically determining the oxytocinase level in the serum. The oxytocinase activity in the serum had previously been measured by biological assay. The substrate, L-cystine-di-beta-naphthylamide is decomposed by the action of oxytocinase with splitting off of the colorimetrically measurable beta-naphthylamines. In the examination of 365 serums the enzyme activity was found to increase progressively in healthy pregnant women up to the moment of birth. The oxytocinase level showed either a temporary or permanent decrease in the 10th lunar month in a small percentage of women. The level was highest in most of the pregnant women at the time of delivery. It returned to the normal level of a nonpregnant woman within six weeks.

The blood of the umbilical cord showed the normal level of a nonpregnant woman, and the retroplacental blood showed the highest level observed. No aminopeptidase activity could be detected in the amniotic fluid. Benign or malignant tumors of the sex organs did not change the oxytocinase level of the serum. Patients with certain hepatic diseases showed a marked rise of the aminopeptidase activity. In patients with hyperemesis gravidarum the oxytocinase level in the serum was 13% lower than in healthy patients. Extrauterine and intrauterine pregnancy of the same duration showed equal levels. In a woman with genuine prolongation of pregnancy beyond term a decrease of the oxytocinase level in the serum was observed after the patient reached the calculated term.

Oxytocinase blocking agents may not be present in the serum of patients who are not pregnant. Sudden fluctuations in the oxytocinase level in the presence of severe hemorrhages during pregnancy, parturition, and immediately after birth may be explained by changes in the fluid balance in the body. Oxytocinase does not seem to be responsible for the presence of aminopeptidase activity in the serum of women who are not pregnant, of men, and of patients with hepatic diseases. Measurement of the oxytocinase level constitutes an accurate chemical test for pregnancy and gives the approximate age of the fetus.

BRAZIL

Tolazoline and Lymph Node Biopsy.—Dr. B. Guida Jr. studied the usefulness of tolazoline and cervical lymph node biopsy in a series of 102 patients with lung lesions and with cancer of the esophagus (*Rev. paulista med.* 53:234, 1958). The series was divided into two groups. Group 1 consisted of 53 patients suspected of having pulmonary cancer and group 2 of 49 suspected of having cancer of the esophagus. In group 1, 37 had a histological diagnosis of cancer and the remaining 16 had other diagnoses or no diagnosis. The author studied the results of the biopsy in its relationship with the pulmonary localization of the lesion and the presence or absence of palpable nodes in the supraclavicular region. He found that in 37 patients the tolazoline biopsy gave a correct diagnosis in 20, thus eliminating the necessity of using other examinations. The

---

The items in these letters are contributed by regular correspondents in the various foreign countries.

tolazoline biopsy offered the possibility of a diagnosis by a simple technique, as the surgical procedure may be performed with local anesthesia in an outpatient clinic. Endoscopy, used in 14 cases, confirmed the diagnosis in 5. In only 10 patients was thoracotomy performed for the confirmation of the diagnosis. In 17 there were palpable nodes at the base of the neck. Of these, 13 had a positive diagnosis of cancer. On the other hand, of the 19 without palpable nodes at the base of the neck, 7 had positive biopsy findings. The presence of palpable nodes does not indicate, nor does their absence rule out, metastases. In the 16 patients with negative biopsy findings, 7 were subjected to exploratory thoracotomy, which led to the discovery of five cases of pulmonary abscess and two of aortic aneurysm.

Of the 49 patients with esophageal cancer, 31 had a positive histological diagnosis. The diagnosis of the rest was based on clinical and radiologic findings. Biopsy was performed in 23 on the right and in 26 on the left side. There were palpable nodes in 21—3 in the upper, 5 in the middle, and 13 in the lower third. In this group of 21 patients, the biopsy was negative in the nodes from the middle and upper thirds and positive in 7 of those from the lower third. The biopsy was performed on the side of the palpable nodes. In the patients with no palpable nodes, a single biopsy was positive in two on the right side, from a total of three taken from the middle third. There was one positive biopsy in four patients with no palpable nodes in the left side, taken from the lower third. Thus, of the 49 patients in group 2, the biopsy was positive in 9. Tolazoline biopsy appeared to be indicated in patients suspected of having cancer of the esophagus whenever there is a palpable node in the supraclavicular region or whenever the endoscopic biopsy is negative.

Cancer of the Uterus.—Dr. Arnaldo de Moraes and co-workers (*An. brasil. ginec.* 46:61, 1958) compared colposcopy, colpocytology, and biopsy for the early detection of cancer of the uterus. They found this a complex problem. Considering only colposcopy and cytology, they concluded that what was really being compared was the personal efficiency of the investigators. Their files included more than 9,000 cases, reduced to 8,542 after the elimination of incomplete records. After a second selection of patients suspected of having cancer of the uterus by one or more of the methods of examination, they studied a series of 660 cases which were divided as follows: 359, or 54.4%, that showed agreement of colposcopy, colpocytology, and biopsy; 32, or 4.7%, that showed agreement of colposcopy and biopsy; 23, or 3.4%, that showed agreement of cytology and biopsy; 52, or 7.8%, that showed agreement of colposcopy and cytology; 106, or 16.6%, in which the tentative diagnosis was based on colposcopy only; 67, or 10.0%, in which it was based on cytology only; and 21, or 3.1%, in which it was based on biopsy only. Thus the total agreement between cytology and colposcopy amounted to 62.2% of the cases. The greater number of positive diagnoses by means of colposcopy (66.9%) may be explained by the inclusion of patients with minimal lesions (small mosaic areas, erosions, and noncharacteristic proliferations). In 92 patients with positive colpocytologic examinations in stages 3 and 4, the control by repetition revealed a gradual decrease of positivity, eliminating the suspicion of malignancy in more than half of the patients. The authors concluded that, particularly in those with epidermoid cancer, the best results are obtained by the simultaneous use of colposcopy and cytology, which must be considered as concurrent and not as competitive methods of diagnosis.

Acute Pancreatitis.—At a meeting of the Associação Paulista de Medicina, Dr. David Rosenberg reported a series of 275 patients with acute pancreatitis. The age of the patients varied from 6 to 82 years, 111 being between ages 21 to 40 years and 132 between ages 41 to 60 years. About 25 years ago the treatment of acute pancreatitis was mainly surgical, but the tendency is now more and more conservative. This is due principally to the more frequent clinical diagnosis and the observation of a great number of patients cured without operation. Thus, in one group of 47 patients, the early surgical treatment, used in 18, showed a case fatality rate of about 50%, while in 27 treated conservatively this rate was only 18.5%. The medical treatment aims principally at alleviating the pain; combating the shock by transfusion; correction and maintenance of the electrolyte, caloric, and vitaminic equilibrium; preventing infection by means of antibiotics; and inhibiting the pancreatic secretion by dieting. These general measures were used on 207 patients, with 28 deaths (13.5%). Surgical treatment was used on 68 patients, with 19 deaths (27.9%). In 13 of the latter the operation was exploratory. The exploratory laparotomy was performed in cases of wrong (9) or doubtful diagnosis. In most of these patients, as the true diagnosis was established, medical treatment was instituted. Dr. Rosenberg concluded that the surgical treatment of patients with acute pancreatitis has very limited indications.

INDIA

Vaginal Cytology.—Malkani and Sikand (*Journal of Association of Medical Women in India,* vol. 46, Aug., 1958) stated that as the endometrium reflects the activity of the ovaries, examination of the endometrium at suitable intervals can be used to ascertain the possible cause of amenorrhea and to indicate the response to various drugs. Endometrial biopsy may cause some discomfort to the patient, while the collection of vaginal smears is a much simpler procedure and repeated examination of such smears can help in following the response to therapy for restoring menstruation in patients with amenorrhea. The authors studied 29 such patients. Amenorrhea after removal of uterus or ovaries, after radiation, and during pregnancy and lactation was not included in this study. No patient with a history of amenorrhea of less than six months duration was included. Primary amenorrhea was assumed if the menarche had not occurred by the 18th year.

Endometrial biopsy was performed once a week for six to eight weeks and vaginal smears were taken on alternate days during the same period. The ovarian function was graded from the vaginal cytology according to the method of De Allende and Orias, and the endometrial biopsy was dated according to the method of Hertig and Rock. The results were then correlated. Three patients in this series had primary amenorrhea, and 26 had a secondary type of amenorrhea. The age of the patients varied from just under 20 to 35 years. The age at menarche in the patients with secondary amenorrhea ranged from 12 to 15 years. Menstrual history was normal in 12 patients, oligomenorrhea was present in 6, menorrhagia in 5, and hypomenorrhea in 3. The duration of secondary amenorrhea varied from six months to six years. The secondary sex characteristics were normally developed in 24 patients, underdeveloped in 4, and of masculine type in 1. Pelvic examination gave normal findings in 10; a hypoplastic uterus was present in 7, a bulky uterus in 1, pathological adnexa were found in 10, and a cystic ovary in 1.

An atrophic vaginal cytology curve was observed in 12 patients and indicated an absent or markedly insufficient ovarian function, but whether the ovarian failure was due to local ovarian disease or was secondary to disease of the pituitary or hypothalamus could not be determined from the vaginal smear. An acyclic hypotropic curve was observed in five patients. It showed a consistently low estrogenic level which was insufficient to produce menstruation. A cyclic hypotrophic curve was seen in six patients and indicated an estrogenic level lower than normal but sufficient to produce menstruation. A eutrophic curve was noted in one patient and a high cornification type of cytology was seen in three, the latter signifying a persistently high estrogenic level. Two patients had the findings of a persistent luteal phase. The results of endometrial biopsy showed an atrophic endometrium in eight patients, an early proliferative phase in six, a proliferative phase with dilated glands in two, a secretory phase in two, a proliferative changing to secretory phase in one, a tuberculous endometritis with proliferative phase in three, and tuberculous endometritis with loss of endometrial structure in seven.

The diagnosis of these 10 patients with tuberculous endometritis would have been missed if the vaginal cytology alone had been studied, and the ovarian function in 16 could not have been determined by studying only the endometrium without examining the vaginal smears. In 13 patients vaginal cytology and endometrial biopsy gave identical information as far as ovarian function was concerned. Thus, vaginal cytology was found to be the method of choice for studying ovarian function and endometrial biopsy was indispensable for diagnosing endometrial tuberculosis. A study of vaginal cytology is also important for prognosis. Atrophic cytologic findings indicate a poor prognosis and a persistent luteal phase or persistent high cornification curve indicates a more favorable prognosis.

Labor After Previous Cesarean Section.—N. S. Devi studied a series of 50 labors after previous cesarean section over a period of four years (*Journal of Association of Medical Women in India*, vol. 46, May, 1958). One woman delivered naturally twice during this period; 32 had a repeated section (26 for cephalopelvic disproportion, 2 for repeated uterine inertia, 1 for a ruptured lower segment scar, 1 for threatened rupture of a classic scar and uterine inertia, 1 for post-maturity and floating head, and 1 for a floating head and thick cervix) and 18 had a vaginal delivery. In 14 of these forceps were applied to avoid strain on the scar, and 4 were delivered unassisted. There were no maternal deaths but there was one stillbirth in the group who had a repeated section. Of the 50 there were 34 who had had the previous cesarean section because of disproportion. Of these, 25 required repeated section, all for disproportion, and 9 delivered vaginally. Thus, section was not always necessary even in the group with disproportion. The average weight of the babies in the group who had a repeated section was 6.7 lb. (3,040 Gm.), in those delivered by forceps 6.1 lb. (2,768 Gm.), and in those delivered naturally 6.7 lb. Of the remaining 15 belonging to the group of nonrecurrent causes, repeated section was performed on 6 and delivery was vaginal in 9; 7 of these 15 had uterine inertia, 3 had antepartum hemorrhage, 2 had breech presentation, 2 had severe preeclampsia, and one had a tumor complicating pregnancy. Vaginal delivery in this group thus occurred in only 60%.

Repeated section was indicated because of uterine inertia in two patients, rupture of a lower segment scar in one, threatened rupture of a classic scar and uterine inertia in one, a floating head and thick cervix in one, and postmature floating head in another. In the group with disproportion, vaginal delivery occurred in 23.5% as opposed to 60% in the group with a nonrecurrent cause. Thus, once a cesarean section is performed subsequent deliveries need not always be by cesarean section. The type of previous section is important. The lower segment scar ruptured in only 0.3% of the patients in this series while the classic scar gave way in 3.6%. Induction of labor may sometimes be necessary to avoid a repeated section for the possible disproportion that may occur if the pregnancy is prolonged. Thus in one patient who had had a previous lower segment cesarean section, labor was successfully induced at 41 weeks.

Pyracortine.—Bhattacharya and Bhuyan (*Antiseptic,* vol. 55, Sept., 1958) treated 16 patients (6 who had rheumatoid arthritis, 6 who had spondylitis ankylopoietica, 2 who had gout, 1 who had acute rheumatic fever, and 1 who had osteoarthritis), all of whom had moderate to severe pain, with tablets of Pyracortine, each containing 0.75 mg. of prednisone and 150 mg. of amidopyrine. The duration of the disease varied from two days to six years. The subjective and objective improvement including improvement in pain and tenderness of the affected part, swelling, color, temperature, mobility of the painful parts, and changes in the sedimentation rate were observed. A watch for untoward side-effects was kept by noticing changes in body weight, palpation of the liver, appearance of edema, red blood cell counts, hemoglobin level, blood urea, urinalysis, development of skin rashes, and gastric dysfunction.

Patients were observed for a minimum of three days after the stopping of treatment to note development of withdrawal effects. The total duration of treatment was 12 days. The results of treatment were excellent in one patient with acute gout and one with acute rheumatic fever; in three with spondylitis ankylopoietica and one with rheumatoid arthritis they were good; in five they were fair; and in five they were poor. There was no correlation between the type and duration of disease and the response to treatment. The sedimentation rate of eight patients fell but changes in the sedimentation rate had no relation to the clinical response to treatment. In the two patients with gout, the blood uric acid showed a reducion of 20 to 25%. A slight increase in weight was seen in a few patients. No dyspeptic symptoms were noticed. In six patients a slight fall in the total leukocyte count was noticed and in three this count showed a rise. In five the hemoglobin level had increased at the end of treatment. The liver did not show any changes clinically. The blood urea level was normal in all patients and the urinalysis did not show any abnormality. No skin reaction was noted.

Acute Nephritis.—A. Girija studied a series of 100 children with acute glomerulonephritis with special reference to cause and clinical features (*Antiseptic,* vol. 55, Sept., 1958). The disease probably runs a more benign course in India due to the lower protein intake and the predominantly carbohydrate diet. More than half of the patients belonged to the age group 3 to 7 years (range 3 mo. to 11 years). The sex ratio was 61 boys and 39 girls. Only one patient had a family history of acute nephritis. This disease occurred uniformly throughout the year. Twenty-one patients gave a history of scabies a few weeks before the onset of acute nephritis, 10 had a mild respiratory infection prior to the illness, 1 had an extensive seborrhea of the scalp a month before the onset, 1 developed acute nephritis while a boil on the scalp was being treated, in 1 the illness followed vaccination for smallpox, in 1 severe dysentery preceded the onset by one month, and in 1 nephritis followed treatment for ascariasis.

Most of the children came to the hospital for puffiness of the face and slight edema of lower limbs. Almost all had oliguria. Hematuria was commonly seen, but its degree varied. In most patients little disturbance of general health was observed at the onset of the disease. In one severe vomiting was the initial symptom. Edema of varying degrees was present in all but one. Although oliguria was common, complete suppression of urine occurred in only one patient. The urine was dark brown in most patients, and microscopic examination revealed red blood cells in all. Only 27 had fever. Hypertension was not common. Epistaxis occurred in one patient while under treatment. Four had diarrhea, and in 12 the main complaint mentioned by the mother was dyspnea which was due to cardiac failure. These patients showed dulness on percussion and moist rales at the base of the lungs. The heart was involved in 12 patients. Blood protein levels were estimated in three and in all of them they were 3.5 Gm. per 100 c.c. The blood cholesterol level was estimated in some patients, and all of them gave normal values. The blood urea level was elevated to about 65 mg. per 100 c.c. in two patients and in others it was below 40 mg. per 100 c.c. The red blood cell count was often found to be lowered to about 3,500,000, and the hemoglobin level varied from 65 to 70%.

ISRAEL

Health Standards.—Israel's standard of living, as judged by statistics regarding births, infant mortality, crude death rate, and life expectancy, is on the whole far above the comparable level of the other countries of the Middle East. In some respects it compares favorably with that of such countries as the United States, Switzerland, and Sweden. These facts were revealed in the ninth edition of the United Nation Demographic Yearbook. Israel's infant mortality rate in 1956 per 1,000 population was 35.9 for Jewish children. The comparable rate of Egypt was 148.5. Israel's crude death rate (deaths per 1,000 population) was 6.3 for the Jewish population in 1956, while that of Egypt was 18.4. Live births in Israel in 1956 were at the rate of 28.8

per 1,000 population, while in Iraq it was 15.5 and in the United States 24.9. Israel also had a higher life expectancy than any of its Arab neighbors. A one-year-old boy in Israel can reasonably expect to reach the age of nearly 70, while an Egyptian boy who reaches the age of one will, in all likelihood, live only until he is about 44. A 50-year-old Jew in Israel may expect almost 25 more years of life, while an Egyptian man of the same age will probably live another 19 years. Egypt has a tuberculosis case fatality rate of 22.5 per 100,000 population, while the corresponding rate for Jewish residents of Israel is only 5.9.

Jaundice due to Chlorpromazine.—An attempt to prevent jaundice due to chlorpromazine was reported at the Congress of the Israel Medical Association by F. Dreyfuss and co-workers of the Hebrew University Hadassah Medical School and the Talbieh Psychiatric Hospital, Jerusalem. They assumed that the histological and biochemical findings, pointing to intrahepatic obstruction as the mechanism of this complication, might be caused by inspissation of the bile and interference with its flow. They, therefore, gave to patients being treated with chlorpromazine a large additional amount of fluid during the course of administration of the drug. Whereas in the first 362 patients treated with chlorpromazine at the institution 16 cases of jaundice had appeared (4.4%), the number dropped to 2 in 588 (0.34%) so treated when the patients were given about 2.3 liters of sweetened tea or water in addition to their regular fluid intake. There was no difference between the two series as to the selection of patients and the schedule of chlorpromazine treatment.

Sensitivity to Olive Pollen.—Kessler (*Depim Refuim* 18:141, 1958) reported that the pollen of olive trees may sensitize persons disposed to allergy by heredity and provoke seasonal rhinitis, conjunctivitis, bronchial asthma, and skin troubles. In the regions where olive trees grow patients with this kind of sensitivity are frequent. Of all the pollen allergies in Israel this is second only to the sensitivity to pollen of spring grasses. It is the most important kind of pollen allergy from pollinating trees.

Clotting Factors.—A series of 153 patients with thrombophlebitis was studied by C. H. Fryd (*Harefuah* 55:168, 1958). On classifying the patients by country of origin, it was found that they came from 19 countries. The fact that none were from Yemen attracted special attention, since coronary occlusion is rare among Yemenites. A study of thromboplastin generation was therefore carried out among the various ethnic groups, but no clear-cut pattern specific to any group, including Yemenites, was found. On study of the ratio between the platelet count in plasma from blood removed by venepuncture and that in fingertip capillary blood, an apparently significant difference was found. The ratio between these two counts in normal subjects is usually between 1:2 and 1:3. Ratios in this range or higher were found for almost all of the non-Yemenite patients, while Yemenites tended to have lower ratios. Since the platelets play such an important role in clotting, the results of this preliminary study may add to understanding of the problems of thrombosis, and possibly of atheromatosis also.

Psychosis After Asian Influenza.—Z. H. Winnik and co-workers (*Danim Refuim* 18:112, 1958) observed several patients who after Asian influenza developed an acute psychosomatic syndrome characterized by confusion, psychomotor agitation, hallucinations (mostly visual), and delusions. One patient showed periodic catatonia. Psychological complications have been described in connection with various epidemics of influenza, but no communications on neuropsychological complications in connection with Asian influenza have been found, although the disease in 1957 affected mankind on a global scale. Neurological investigation, including spinal fluid examination, did not reveal any pathological changes. The electroencephalogram remained unchanged in three patients but in the fourth signs of a generalized disturbance with a convulsive pattern were seen. In the follow-up of this patient after recession of the psychosis, the tracing showed great improvement but not a complete return to normal. The titer for antibodies of Asian influenza was high and increased as the psychosis progressed. This was accepted as evidence of an acute infection. In all cases the psychosis developed in a personality showing clear indications of a certain predisposition to psychological instability. This predisposition consisted of psychoneurotic character traits. Recent psychic trauma such as acute psychic conflict, prolonged stress, and physical exhaustion were also noted as predisposing factors. The ego of these patients was unable to deal effectively with the added stress of the illness and reacted with an acute psychotic episode. The course of the psychosis was benign. All the patients recovered without special treatment. In view of the extent of the epidemic, it was concluded that the virus was not highly neurotoxic.

NETHERLANDS

Asian Influenza.—J. Mulder and co-workers (*Nederl. tijdschr. geneesk.* 102:1992, 1958) reported the results of their investigations of the 1957 Asian influenza pandemic. Just before its appearance in the Netherlands in June, 1957, the authors examined 1,256 serums for antibodies against the Asian influenza virus. On the whole only persons over 70 showed a positive titer. These titers were independent of evidence of infection with other A-strains occurring in the Netherlands between 1933 and 1956. The authors also showed that no recent infections with the Asian strain had occurred. On the other hand many persons who were over 35 showed a high titer for antibodies against the Shope strain of influenza A virus which caused the 1918 pandemic. The authors concluded that the presence of antibodies against the Asian strain in older persons indicated an earlier contact with this virus. This might have been the virus of the 1889-1890 pandemic, which also started in Asia. The Shope strain has since the 1918 pandemic continued in North American swine with an unchanged antigenic composition. An epidemic among swine in Asia did take place early in 1957. The 1957 pandemic might, therefore, have originated from a persistent carrier state in Asian swine since the 1889-1890 pandemic. The interval between pandemics must be long enough to produce a younger generation susceptible to the virus.

The occurrence of small epidemics between pandemics could be explained by a gradual change of the antigenic structure during the interhuman passage of the virus. In this way low titers for antibodies against the Shope strain in persons born after the 1918 pandemic could be explained. The Asian strain showed a definite pneumotropism for the human lung, but it was not highly virulent. This virulence might increase in the future, however, as a result of a better adaptation of the virus to human tissues. In such a way a second wave of Asian influenza with a higher pneumotropic virulence could be expected.

Blood Transfusions in the Merchant Marine.—Dr. H. B. G. Breijer (*Nederl. tijdschr. geneesk.* 102:1813, 1958) reported on the transfusion service on board the ships of the Royal Rotterdam Lloyd. At first the ships were equipped with only test serums. Difficulties, however, were encountered in finding suitable donors and in determining the Rh factor. In order to avoid these difficulties volunteers were sought among the ship's crew. On the evening before the arrival of the ship, blood samples were taken and sent next day to a laboratory of the official transfusion service. At the beginning of each voyage the ship's doctor received a list of donors available on his ship. On the three main ships with a total capacity of about 4,000 passengers, on the average about 60 donors appeared to be available. The ships' doctors are specially trained in giving transfusions. Thus it has been possible to give on these three ships during the last 18 months 10 transfusions to four patients.

Tuberculosis Death Rates.—According to the Central Office for Statistics in the Netherlands 515 persons or 4.7 per 100,000 population died of tuberculosis in 1957. In 1956 these figures were, respectively, 593 and 5.4. Though there still appears to be a decrease of this mortality rate, this decrease is less prominent than during the previous six years. According to provisional data 7,936 new cases of tuberculosis were reported in 1957. In comparison with 1956 this means an increase of 3%. Probably, however, when the final data for 1957 becomes available a nearly equal morbidity rate for 1956 and 1957 will be found.

UNITED KINGDOM

Bronchitis and Outdoor Occupations.—Dr. D. Reid, at a conference of the National Society for Clean Air, stated that the effect of working out of doors in industrial areas was to increase markedly and specifically the frequency of attacks of disabling bronchitis and other serious respiratory diseases. He gave an account of the results of a survey carried out on government employees, including postmen. After the age of 25 the frequency of bronchitic attacks among postmen increased in all areas but relatively more so in the areas of heavy air pollution. Bronchitis rates appeared to be more closely related to the local level of air pollution, while influenza morbidity was more closely associated with domestic overcrowding. Lung cancer showed only a slight correlation with air pollution but a close one with population density. Pulmonary tuberculosis rates were similar, with a definite association with overcrowding. A simple explanation of these findings is that bronchitis is affected by urban air pollution, while the overcrowding in cities has a greater effect on infectious diseases, such as influenza and tuberculosis. The fact that more densely populated areas had higher lung cancer death rates might be related to increased smoking rather than to air pollution due to the burning of coal.

Data compiled by Gorham suggested a correlation between bronchitis mortality and the pH of the material precipitated in polluted air (*Lancet* 2:691, 1958). Suspended particles of foreign matter act as nuclei for the condensation of droplets of sulfuric acid, and in some areas of hydrochloric acid, so that the town dweller is in fact inhaling an acid aerosol. Gorham estimated that in dry weather evaporation occurred at the surface of the aerosol, which might have a pH below 2 at times. This corresponds to the pH of gastric juice and would undoubtedly act as a bronchial irritant.

Physicians Need Not Give Death Certificates.—According to a ruling by the Minister of Health, when a patient dies the physician ceases to be responsible and is not specifically obliged to issue a death certificate. The Minister allowed an appeal by a physician in Kent against a decision by his local executive council that he failed to provide proper treatment for a patient, who had since died. The council had recommended a penalty of $280. The facts were that a patient was dying, or may even have been dead, when a relative summoned the doctor several times without success. A call was made in the evening for a death certificate by the relatives, who believed the patient to be dead, and they expressed their feelings in no uncertain terms to the physician. The matter was referred to the local executive committee, which decided that the doctor was negligent. The Minister reversed this decision and held that the physician had not actually failed to treat a patient, which under his terms of service he was obliged to do. This ministerial ruling would suggest that if a doctor thinks a patient to be dead he need not make a visit to confirm the fact and that he is under no statutory obligation to issue a death certificate.

Amphetamine Psychosis.—Dr. P. Connell has collected 42 cases of amphetamine psychosis (Amphetamine Psychosis, London, 1958). The psychosis developed in 8 patients after they had taken a single dose, in 4 after they had taken amphetamine and alcohol, and in 30 after repeated medication for a month or more. So severe were the symptoms that 39 of the patients were hospitalized, 26 of them in an observation ward. In about 40%, amphetamine, or one of its derivatives, had been given for tiredness, depression, or obesity—dextroamphetamine usually being given for the treatment of the latter. Some patients were veritable amphetamine addicts, one taking as much as 975 mg. of amphetamine. Such quantities can be obtained by breaking open amphetamine inhalers. Many of the patients were addicted to other drugs or to alcohol, but some normal and apparently well-adjusted persons were affected by these drugs.

The initial diagnosis was often schizophrenia, and four patients had deep insulin therapy for this misdiagnosed condition before the true nature of their condition was discovered. Recovery in the hospital usually took about a week, but as some of the patients were of unstable personality and some were addicts to one drug or another, relapse frequently occurred. Patients showed withdrawal symptoms in the form of depression and somnolence. The amphetamine groups of drugs are not as harmless as is generally supposed, and amphetamine psychosis appears to be more common than the literature would suggest. In all patients with acute or chronic paranoid schizophrenia the urine should be tested for the amphetamine group of drugs to avoid errors in diagnosis and treatment. These drugs should never be prescribed routinely for depression, fatigue, or obesity, and amphetamine psychosis should be borne in mind as a diagnosis.

Fees for Anesthesia in Hypnosis.—A physician can claim a fee for giving an anesthetic during childbirth if he is working in the national maternity medical service. The Minister of Health has now agreed to the payment of a fee for securing analgesia by hypnosis in maternity cases, provided the doctor concerned is accustomed to using hypnosis as part of his professional practice. The fee paid will be the same as if an ordinary anesthetic were used. A case arose in 1957 when a practitioner secured analgesia in childbirth by hypnosis but was refused a fee. The matter was referred to the local executive council and to the anesthetists group committee of the British Medical Association, which held that a fee should be paid under the circumstances. The Minister of Health has now agreed on a fee of $5.

Sensitivity to Penicillin in Poliomyelitis Vaccine.—British poliomyelitis vaccine contains 200 units per milliliter of penicillin. Although it has been considered by the Ministry of Health that this quantity is unlikely to do any harm, a general practitioner of Blackpool has reported a reaction, due presumably to the penicillin present, in a boy of 12 given the vaccine. The boy was already known to be penicillin sensitive, and a day after the vaccination he complained of frontal headache, malaise, and an urticarial rash on the trunk, limbs, and buttocks. An antihistaminic was given. Two days later the boy suffered from dyspnea, bronchospasm, and a tight feeling across the chest. This was relieved by a spasmolytic. In the physician's opinion the reaction was due to the penicillin in the vaccine.

Mycology of the Mouth.—Few attempts have been made to study the mycology of the mouth in relation to fairly common oral lesions. This was done by Fox and Ainsworth who inoculated slopes of malt extract agar with mouth scrapings from patients with various oral conditions and examined them for fungi (*Brit. M. J.* 2:826, 1958). If these developed they were transferred to pure culture and grown for identification. Scrapings from the mouths of normal subjects were also made. The oral mycology was investigated in 49 patients with angular cheilosis, gingivostomatitis, "coated tongue," lingua nigra, lingua geographica, and denture sores. It was concluded that Candida albicans plays a primary part in the cause of angular cheilosis and possibly of gingivostomatitis. The numerous other fungi isolated from the mouth of patients with the remaining four conditions were considered to be of doubtful etiological significance.

Fatty Acids.—Dr. H. M. Sinclair (*The Practitioner*, Oct., 1958) stated that the treatment of obesity allowing unlimited fat and restricting carbohydrate needs further investigation before it can be recommended to the public. High-fat diets in the United Kingdom mean diets high in relatively saturated fat and relatively deficient in essential fatty acids. He is also critical of the present method of feeding infants and children. Orange juice is not necessarily the best way of administering ascorbic acid; black currant juice would probably be a much better source. Cod liver oil is a bad vehicle for vitamins A and D in view of its absence of essential fatty acids and the presence of nonessential fatty acids that increase the need for essential fatty acids. Cow's milk, and particularly dried cow's milk, if exposed to air, is very inferior to human milk. Although the school meals and milk-in-schools schemes have improved the health and physique of schoolchildren and have played an important part in educating the children in good dietary habits, they have tended to overfeed the children, particularly with cow's milk and butter. Excessive feeding during the period of maturation is likely to lead to early maturity and to early death from chronic degenerative diseases. Excessive use of cow's milk and butter may lead to a deficiency of essential fatty acids.

There is no conclusive evidence that high serum cholesterol levels cause atheroma. On the other hand, there is evidence that a deposition of cholesterol occurs in various sites in the body through failure of the tissues to use the cholesterol they are forming because of a relative deficiency of essential fatty acid (a low ratio of essential fatty acid to nonessential fatty acid) in the tissues. This failure of the utilization and metabolism of cholesterol could cause a rise in serum cholesterol. Essential fatty acid seems to be required for fibrinolysis, which is essential for removing clots that regularly form intravascularly. Decreased fibrinolysis, perhaps also accompanied by increased coagulability of blood, could account for coronary thrombosis in the presence of atheroma. The rapid increase in reported deaths from pulmonary embolism and infarction, which is occurring at the same rate as deaths from ischemic heart disease, could be similarly attributed to a relative deficiency of essential fatty acid. This deficiency causes a structural defect in cell membranes and connective tissue, and in consequence the body becomes increasingly susceptible to injurious agents, including infections, ultraviolet light, x-rays, chemical carcinogens, and hydrochloric acid in the duodenum. It is possible therefore that a relative deficiency of essential fatty acid could play a part in the cause of coryza and poliomyelitis by allowing the virus to traverse the nasal and intestinal mucosa, and of leukemia, lung cancer, and duodenal ulcer.

Q Fever.—Marmion and Stoker stated that Q fever is widespread in Britain and is a cause of some cases of pneumonia and fever of unknown origin (*Brit. M. J.* 2:816, 1958). The infection occurs mainly through cattle and to a lesser extent through sheep. Rickettsia burneti was isolated from the milk of cows and goats, from the placenta and wool of sheep, and from the sheeptick. There was evidence of an increased frequency of infection in sheep and cattle in Kent. In this county the clinical cases occurred more in newcomers to the area, the residents of long standing being presumably immune. The chief mode of spread from cattle to man seems to be through the consumption of raw milk infected with the rickettsia. Milk may contain 5 to 500 guinea pig infective doses per milliliter. The author believed that more persons are not infected because the whey antibody in infected milk may afford some protection. The contact with the antibody-coated rickettsias leads to subclinical rather than clinical infection. In one area 7,000 to 8,000 persons were getting infected milk from two dairies. There were 94 cases of pneumonia among these, and it is estimated that about 30 were due to Q fever. Pasteurization at 161 F (71.7 C) for 15 seconds or 145 F (62.8 C) for 30 minutes kills the rickettsias. The authors showed that persons drinking pasteurized milk have a lower probability of contracting Q fever than those in the same area drinking raw milk. Infection was not limited to persons drinking raw milk or handling animals but was found in all sections of the community. Outbreaks occurred at any time of the year but were commonest between April and July.

Distribution of Physicians.—The medical profession in Scotland is now almost equally divided between general practice and hospital work (*Health Bulletin* 16:57, 1958). The relative figures are 2,890 in general practice and 2,886 in hospital work. This latter figure represents an increase of 30% in the last eight years. In Western Germany, the comparable proportions are 71% in general practice and 29% in hospital work.

Mental Patients in Hospital.—According to the annual report for 1957 of the Board of Control, which is responsible for the supervision of the mental hospitals in England and Wales, the number of patients in mental hospitals (146,962) was the lowest since 1949. On the other hand, the number of admissions is climbing steadily, and last year was 88,943, compared with 55,856 in 1950. Another striking feature of the report is the continued increase it shows in the number of voluntary admissions. In 1957, voluntary admissions increased to 82.6% (73,499) and certified cases fell to 15.9% (14,126). Of the total admissions in 1957, 41,908 (44.9%) were readmissions. Of the 82,778 patients discharged, 19,643 had recovered, in 54,054 cases the illness was relieved, and 8,822 showed no improvement.

Politics and the National Health Service.—In an age when treatment is complex and costly and when we expect equal care to be available for all, a national health service is an obviously efficient scheme, according to Sir Keith Joseph, a Conservative Member of Parliament, in an address to a Conservative Party Conference. He suggested that, as the Service grows and improves, there may be elements in it that can be charged to patients without discouraging early treatment or unduly burdening the ill. Such charges would be subject to a means test so that those least able to afford payment would be exempt. Contributions, too, could grow as average earnings grew. A graduated contribution, varying precisely with earnings, would have to take personal circumstances into account and would quickly become a second tax system.

He foresaw an inevitable increase in the cost of the Service, and this would include increased remuneration for physicians. He believed that the general practitioner should be freed from the economic necessity to maximize the number of his patients, regardless of the actual constructive treatment he is willing or able to give them. He said that private practice should be encouraged and that more physicians should depend on it for part of their living. It is not good for doctors to have only one possible employer—the government; yet this would be the result if private practice were to die. The chief argument against private practice is the allegation that two standards of service would result.

Sexology and Medical Students.—At their annual meeting last year, the British Medical Students' Association held a half-day symposium on the teaching of sexual and marital relations to medical students. This subject was chosen because both students and physicians believed that these subjects are often taught inadequately, if indeed they are taught at all. A report of the proceedings shows that attention was almost equally divided between the necessity for helping students to solve their own sexual problems and instructing them to deal with the similar problems of their future patients. According to one speaker, in the case of a medical student, the study of anatomy and physiology induces a mechanistic approach to matters which are primarily spiritual and psychological. The student whose sex education has been inhibited or distorted by his home background can get into serious difficulties, for he may already have severe emotional tensions when he arrives at the university. It was concluded that (1) the teaching in this field is inadequate in many medical schools, (2) the creation of a new department is not necessary, (3) proper teaching must be available, (4) libraries must have a wide selection of literature on these topics, and students must be made aware of them, and (5) the most important factor of all is to help each student to solve his own problems as they arise.

Health Problems of Directors.—The Institute of Directors has published a booklet, "Health Problems of Directors," in which Dr. H. B. Wright, the head of the institute's medical research unit, tells directors how they can live longer and happier lives. On the subject of vacations, W. J. Mayo said that he was of more use to his clinic steering his yacht than sitting at his desk. Every director should have two vacations a year, and it is contended that much could be gained if senior executives worked a 10-month year of 40-hour weeks. Although alcohol is a poison, in moderation it is recommended, but with several warnings. The cocktail party is a diabolical institution, and the wise executive should curb the present tendency to regard cocktail parties as an official necessity. If he must go to one, he should dilute the alcohol—gin and tonic, whisky and soda, or beer is far less harmful than a martini.

Those who travel abroad are advised to go by boat one way, if possible. Airplanes may be convenient but they are most unphysiological. A slumberette may look good in an advertisement but in reality very poor sleep is the best that can be expected. The executive is advised to try not to work in the aircraft and to try to insist on 24 hours without official functions on arrival at his destination. To rush off the aircraft to the first cocktail party is folly. While on tour, he is advised to insist on at least an hour and a half a day to himself and, if the tour is prolonged, to insist on a five-day week and every fifth week off entirely. Finally, it should be a rule that every executive returning by air should have 48 hours off at home. If he must report to work immediately, he should allow half a day for this and then have the time off.

The Normal Color Index.—Using an automatic red blood cell counter and a Medical Research Council photometer, J. C. F. Pool (*Lancet* 2:550, 1958) measured the color index in 24 normal subjects. He found the mean color index to be 0.99, and the coefficient of variation for the series was 4.93%. The standard error of the mean was 0.0099. The fact that the color index for normal human subjects is so close to unity, when determined in this way, is a fortunate coincidence. In the author's opinion there is no advantage in reporting the ratio of the hemoglobin content to the erythrocyte count as weight of hemoglobin per cell (mean corpuscular hemoglobin) rather than as the color index. Because of the small range of normal color-index figures, it is hoped that small deviations from the normal, which can now be detected reliably, may prove significant indications of disease.

Antivaccinal Gamma Globulin.—Details of the successful use of gamma globulin prepared from the serum of recently vaccinated adults are reported by E. R. Peirce (*Lancet* 2:635, 1958). The two persons in whom it was used had been in contact with a severe case of smallpox in their home for nine days. One was the patient's sister, aged 6 and unvaccinated, and the other was his grandmother, aged 73 and unvaccinated since infancy. Both were vaccinated, with the other family contacts, on April 14, the day on which the patient, who had taken ill on April 6, was diagnosed as having smallpox. Two days later they were given gamma globulin, the child receiving 2 Gm. and the grandmother 1 Gm. On April 21, both child and grandmother developed smallpox but both had mild cases, so mild that in the case of the child had she not been under daily supervision her smallpox would not have been recognized. Although both were successfully vaccinated, it is considered that, in view of the timing, this is unlikely to have had any effect on the course of the disease and that the mildness of the disease in both cases was due to the gamma globulin.

Antibiotics in Acute Tonsillitis and Otitis Media.—Dr. Fry investigated the need for antibiotics in the management of acute tonsillitis and acute otitis media on the supposition that not all of these infections require such specific measures (*Brit. M. J.* 2:883, 1958). Over a three-year period he treated 482 attacks of acute tonsillitis in 405 patients and 552 attacks of acute otitis media in 422 patients. Penicillin, the antibiotic used, was withheld unless there were definite indications for its use. The course of each patient was followed carefully, and there was no hesitation in giving penicillin when it was needed. This occurred in 25% of all attacks of acute tonsillitis—19% in the nonstreptococcic group and 30% in those in whom hemolytic streptococci were found in the throat swabs. In the treatment of acute otitis media, antibiotics were needed in 22% of the patients. They were given in 15% of those with painful eardrum and 34% of those with a discharging ear. The results in both the groups treated with and without antibiotics were satisfactory. No serious complications occurred in either group, and on follow-up three months later only three children were found to be slightly deaf. There were no discharging ears, and recurrences were uncommon. Fry stated that 70 to 90% of patients with tonsillitis and otitis media are treated with antibiotics in general practice, and from his findings he questioned whether this extensive use is necessary. Antibiotics are relatively expensive drugs and not without danger.

Nursing Routine Challenged.—The end of 5 a. m. awakening of hospital patients is in sight. This traditional and unpleasant feature of hospital life has been shown to be unnecessary. Its purpose is to enable patients and wards to be ready for doctors' rounds at 9 a. m. or later. There may yet be opposition to changing the practice from sticklers for the old ways. Nurses are increasingly questioning the need for rousing patients at the traditional time and taking their temperatures at six, and the necessity for a busy ward nurse to stand for hours at the side of a consultant on his teaching rounds while he asks the same questions of successive generations of students. The recent reduction of nurses' hours from 48 to 44 hours a week has sharpened the arguments against extraneous duties and wasteful ways of working, especially where a shortage of nurses exists.

Evaluating General Practice.—Recently a group of Conservative Members of Parliament recommended that general practitioners be divided into grades for purposes of remuneration, based on their respective abilities. Dr. Donald Johnson, who is also a Conservative Member of Parliament, foreseeing difficulties asked how, without direct payment between patient and doctor, which is precluded by the present structure of the National Health Service, the good physician can be judged against his less good colleague. Who will judge the worth of the physician and what will the criteria of judgment be? A medical administrator is likely to see excellence only in administrative qualities. It would be undesirable if a good doctor were judged solely by his attention to record cards and his compliance with administrative instruction.

Doctor as Subpostmaster.—The subpostmasters at South Shields, Durham, are objecting to the choice of Dr. Henry Byrne, a police surgeon, as a subpostmaster when three experienced applicants were rejected. Dr. Byrne said: "My wife will supervise the post office, and I shall assist when necessary. I am sure we shall be able to give good service to the public. I do not intend to withdraw." A spokesman for the local branch of the British Medical Association said: "What a doctor does is his own affair, as long as he looks after his patients and does not offend the health executive council. Why he should want to become a subpostmaster I cannot imagine. I have been playing golf today, and everyone has been asking me if I can sell them a twopenny stamp."

Radiation Hazards.—The suggestion that present assessments of the genetic hazard to man of nuclear and allied radiations may prove false was made at a small conference in London. Dr. T. C. Carter, of the Medical Research Council's Radiobiological Research Unit, believes that, hitherto, research on the effects of radiations on living material has been made almost entirely on the lower animals and on plants, which can stand much larger doses of radiation than can be tolerated by man. From these experiments it has been assumed that the genetic danger from radiation increases directly as the dose increases, but in a critical analysis of the evidence from the few experiments made with small doses, within the range tolerated by man, Dr. Carter showed that this assumption is not justified. He estimated that the necessary research would require about 2,650,000 mice and take over five years at a cost of about $560,000. The importance to mankind for reliable data on the dangers from radiation to future generations cannot be overemphasized.

BUSINESS PRACTICE

This is the ninth in a series of excerpts from the brochure on the Business Side of Medical Practice, prepared by the American Medical Association in cooperation with the Sears-Roebuck Foundation.

BILLING AND COLLECTIONS

Income is what keeps a doctor in practice. How can he guarantee that he will receive the greatest percentage of fees he earns? Once again, the principles of good management apply: advance planning, an established routine, and adherence to that routine.

Here are three keys to maintaining a high collection ratio: 1. Make certain patients understand charges and appreciate they are getting professional service commensurate with the fee. 2. Make it convenient for patients to pay at time of treatment. 3. Send bills punctually and regularly; follow up conscientiously on uncollected bills.

Advance fee discussion is the best means of assuring that patients understand and accept their medical bills. Because people subconsciously resent paying for an unwanted illness, a certain amount of ethical "selling" of the concept of regaining and maintaining good health is advisable. The importance of reaching agreement and understanding about fees in advance of long or costly treatment was discussed earlier and some techniques for initiating fee talks suggested. The patient is entitled to know what to expect—he ought to be forewarned when he is sent for x-rays and other laboratory tests that show up as a sizable figure when his statement arrives. He is buying medical service, and he wants to know approximately what it will cost, just as he wants to know how much a new suit of clothes or a new purchase for the home will cost.

Explaining Charges

The best way to explain medical charges is to itemize each bill. This has been standard practice in the business world for years, yet too frequently physicians send statements merely saying, "For professional services." The doctor himself would be annoyed to receive a bill from a medical supply house which said only, "For supplies shipped," and he should keep this in mind in his own billing.

Patients may forget how many office or hospital calls were made in the interval before the bill was sent and overlook the extent of services given. On the surface, an unitemized bill may appear to be excessive. Today there are simple procedures for itemizing bills. The charge slip is a form widely used. This is a slip usually kept in triplicate which, depending on the doctor's specialty, lists the various types of services he performs.

The patient is given a charge slip to take into the doctor's office with him. During his session with the patient, the doctor notes on the slip the procedures performed and the charge. As the patient leaves the office, he returns the slip to the desk. At this point, instead of the doctor's girl saying, "Would you like to pay for your visit now?" it might be more effective merely to say, "This will be $5." Most people are prepared to pay for routine office visits but often leave the office without paying because no one gave them an opportunity to do so. If most patients can be encouraged to pay as they go, expensive, time-consuming billing can be reduced.

The patient who pays before he leaves the office is given one of the charge slips as a receipt; the others serve as office records. When a patient prefers to be billed, the charge slip is used to prepare an itemized bill or a copy is actually enclosed with the statement. Some physicians are microfilming the information on the charge slip onto the monthly statement. In addition to serving as an itemized listing of services performed, the charge slip provides a check for the office should a patient later question a bill.

Regular Billing

Some definite pattern for sending out statements should be established early in a doctor's practice. Regular billing is an essential part of good collection procedure. Punctuality in billing encourages prompt payment. A doctor who sends bills erratically, perhaps allowing several months to elapse before mailing a statement, must expect his patients to treat their payment responsibilities similarly. It is natural for the patient to think: "If the doctor doesn't attach much importance to the bill, then I won't either." The longer payment is delayed, the harder it is to collect.

Some physicians prefer to send out bills once a month; others mail statements twice a month—on the 1st and 15th. Some follow a cyclical billing system used in businesses, whereby statements go to patients in certain sections of the alphabet on certain dates each month. The kind of billing system is not so important as the fact that the doctor has a system and follows it.

Regular billing and itemization of charges pave the way to easy collections. It also helps if the doctor makes it easier for patients to pay by enclosing a return business reply envelope and clearly specifying the date on which payment is due.

All these things can be done in a dignified, professional manner which does not imply commercialism if the physician puts the business side of his practice in the proper perspective, remembering that his first job is to care for his patients.

Following up on Collections

When regular itemized statements have been sent and payment has not been received, the physician should initiate his collection follow-up program. This program should be based on an understanding of some of the reasons why patients don't pay. There are a number of them, but these three probably are the most common: (1) negligence, (2) inability to pay, and (3) unwillingness to pay.

When a patient merely puts off payment with no good reason, the physician himself may be partly to blame. He may not have sent his bill promptly, or he may not have jogged the patient about his financial responsibilities. Many people tend to pigeonhole their doctor bills, postponing payment until their other debts have been paid. Physicians themselves must educate the public to treat medical bills as they do any other kind of indebtedness—paying what they owe when it is due. If the doctor ascertains that negligence is the reason he has not received payment, he can institute his plan for reminding the patient about the bill.

Some patients who would like to pay sometimes are temporarily unable to do so. If this is the case, the physician should be prepared to understand the situation and help patients make other arrangements, even to budgeting a certain amount each month for the doctor's bill. Time-payment buying is now widely accepted by the public; there is no reason that in special situations or in cases of temporary financial hardship it cannot be applied to the purchase of medical services. Although businesses offering time-payment plans add carrying charges to the bill, this is rarely done in medicine. Because the medical profession is humanitarian in tradition, special approaches to collections which would not work in the "hard, cold, business world" are applied. The physician who stands in the position of a friend to his patients wants to help the individual meet his financial obligations. Interestingly enough, the honest patient who does not pay often seeks out another physician because his pride does not permit him to return again and again to the office where he owes money.

Some patients are unwilling to pay. These individuals may be disgruntled about the bill. Perhaps the misunderstanding was partly the doctor's fault. In this case, an attempt to talk over the situation with the patient is the first step toward eliciting payment. Only in rare instances are patients deadbeats who just do not intend to pay. It is this type of patient who causes the doctor to give serious consideration occasionally to resorting to a tougher collection policy, even to instituting suit.

Considering the factors affecting nonpayment, the physician starts collection procedures to (1) remind the negligent patient about his bill, (2) inquire why payment hasn't been made—is there some special reason for nonpayment? and (3) get patients who have a reason for nonpayment into the office to discuss the problem and work out a solution. Getting adequate credit information in advance helps the physician evaluate a patient's financial situation.

Good records are essential to follow-up collections, so the medical office must secure the following information about new patients on their first visit: (1) full name, correctly spelled; (2) proper person to be billed and relationship to patient; (3) marital status and number of dependents; (4) current address and past addresses for last two or three years (indicates stability, neighborhood, and index of financial status); (5) job details (where a man works is important; what he does is even more vital); and (6) name of person recommending patient.

Such information can be secured quickly and with no affront to the patient. In some offices inquiries are made about patient's charge accounts, since these are good credit indexes. It is poor policy to ask about banks and bank accounts. Superficial signs of prosperity should not color an evaluation of the patient's financial status. When a substantial sum is involved and there is some question, the credit rating can be checked with the local credit bureau. Obviously, it's easier for the doctor in a small town to gauge his patient's ability to pay than it is for a city physician.

Collection Timetable.—Every physician will want to work out his own "collection timetable," but here is one which works for many doctors: first month, send statement; second month, send statement; third month, send a reminder note; fourth month, send a letter; and fifth month, write the patient notifying him that, since he has ignored all communications, the account is being turned over to a collection agency.

The personal approach is the best way to follow up collections. That's why stickers and other commercial devices attached to statements are not always highly effective. After two statements have been sent, a short note from the doctor or his secretary can be sent inquiring whether the patient has overlooked the bill. The letter might read like this: "We thought perhaps you may have overlooked this statement which has been charged to your account since . . ."

The next letter, preferably a letter from the doctor, should invite the patient to the office to discuss any special payment problems or questions he may have about the bill. Whatever kind of reminder is used, it should be informal, sincere, and imply confidence that the patient does intend to pay. Avoid all "pleas," such as "I need the money" and "I have bills to pay, too."

The final letter may imply surprise that the patient has made no response to collection overtures and request once more that the patient get in touch with the office to discuss the situation. If this is ignored, a more formal letter notifying the patient that the account is to be turned over to a collection agency can be sent.

A physician should not be embarrassed about following up on bills that are justly owed him. As his practice develops, an intelligent, efficient girl can handle most of the collection phase of his practice, clearing up many misunderstandings about charges and serving as a good will ambassador.

In every community collection practices differ. Sometimes the doctor carries a credit load until crops come in or some other seasonal source of income develops. This does not mean he discontinues billings during "off seasons" but instead lightens his collection pressures, bearing down during the time patients have money.

The older a bill becomes, the less likely it will be paid. Accounts over a year old seldom return more than 45 cents on the dollar—those two years old, 23 cents. After three years the return is 15 cents on the dollar, and after five years it wouldn't buy a postage stamp. That's why collections should be pursued diligently while the accounts are "fresh."

Often a physician is faced with a decision regarding a bill: should he reduce it or cancel it entirely? Sometimes a patient who has owed him money for many months offers to settle in cash if he will discount the bill. If the charges were correct in the first place and the patient is financially able to pay the entire amount, the wise doctor will not submit to the temptation of accepting the discounted bill. He may soon get a reputation for discounting or "bargaining" for his services.

There are two prevailing philosophies on the question of whether to reduce or cancel a bill entirely in a hardship case. One idea is that a doctor should reduce but not cancel the bill in order to save the patient's pride. The other philosophy is that a doctor should never reduce but should completely cancel a fee, evolving from the belief that no doctor should bargain for his services. The decision to reduce or cancel a fee rests with the personal philosophy of the physician.

Using a Collection Agency

When the doctor has made an earnest effort to collect his own bills and still has not received payment, he may wish to employ the services of a professional collection agency. There are many agencies which specialize in the handling of medical and dental accounts or which have separate departments to handle this type of collection. In some places medical societies operate their own bureaus.

An ethical agency can serve a physician well, prodding the people who can pay, but do not, into settling their debts and uncovering instances where special consideration is warranted. Medical collections call for a different approach than do collections in other businesses. That is why selection of a reputable agency is the physician's first consideration. It is usually best to select a local agency with a good reputation in the community and avoid out-of-state or mail-order-type agencies. Here are some guides in selecting a good agency: 1. Check with the local medical society whose officers probably can give information on the reliability of an agency. 2. Check with the local chamber of commerce or Better Business Bureau. 3. Check with such groups as the medical, dental, and hospital bureaus of America, or the Associated Credit Bureau of America, whose members conform to high standards of operation. 4. Check up on the ownership and financial responsibility of the agency and its promptness in settling for money collected. 5. Find out the kind of collection methods. Ask to see the type of reminders and follow-up pieces used. 6. As a general rule, don't sign a contract. Good agencies seldom use them.

Any physician who is asked to sign a contract in the employing of an agency should proceed cautiously, since there are sometimes traps in the contracts of less reputable agencies which can not be quickly spotted. They may call for payment in worthless bonds instead of cash or withhold any settlement "until the bill has been collected in full," a rare instance in the handling of delinquent accounts.

The Agency Works for You.—The agency is at all times the collection representative for the doctor. The procedures and techniques used in following up his accounts should conform with the ethics and dignity of the profession, and the doctor himself must have the final say on disposition of accounts. It should be the decision of the doctor, not of the agency, for example, whether legal action should ever be taken. A good agency also should be willing to adjust a fee in a hardship case rather than try to boost its own commission by a cold pursuit of the total amount due.

The physician must provide all necessary information to the agency, including basic data from the patient's nonclinical record and a report on his follow-up actions. When the agency takes over an account, the doctor ceases all billings to the patient. If the patient then calls the doctor to discuss the bill, he should be referred courteously to the agency. Any payment made directly to the physician should be reported to agency officials; if it was secured after their collection efforts began, the agency is entitled to a portion of it.

Medical bills turned over for collection to an agency are discounted, and the older the account the greater the discount. Any return is better than none at all. The average cost of collecting medical fees is about 40%, but this rate varies according to individual agreements and local situations. In one city, the average collection on delinquent accounts is 10%. When the doctor employs an agency, he is employing skilled men in the collection field and he must expect to pay for their services. However, when collections rise beyond 25%, it is usually a clear indication the doctor's own office is not doing its part in pursuing collections.

Should You Sue?

Suing to collect a bill is a drastic step that sometimes is offset by the resultant ill will it creates. A vengeful patient—justly or unjustly—may sometimes file a malpractice suit countering the doctor's collection suit. Consequently, many physicians delay any legal actions until after the statute of limitations determining the extent of time during which a malpractice action can be filed expires. This period varies from state to state.

A lawyer is the best person to judge whether or not a physician has a chance of collecting in court. Points to consider are the clear rights of the claim, the patient's ability to pay, exhaustion of other collection means, and justification of the amount by comparison with fees for similar services locally. In more than half of the states and in the District of Columbia doctors may act as their own lawyers in small claim courts—where sessions involving debts usually under $100 are held. The doctor merely presents his claim to a judge after paying a fee of $1 or $2 for a summons to the patient. A small claims court in New York is credited with winning suits for nine out of ten physicians but this doesn't mean those physicians collect. Enforcement of the legal claim is not always carried out.

In all collection efforts, a balance of humanitarianism and firmness seems to get best results.

MEDICAL FILM REVIEWS

A Clinic on Recognition and Management of Respiratory Acidosis: 16 mm., color, sound, showing time 34 minutes. Prepared by Reginald H. Smart, M.D., Hurley L. Motley, M.D., and Joseph F. Boyle, M.D., Los Angeles. Produced in 1958 by Churchill-Wexler Film Productions and Ed Hamilton Productions, Los Angeles, for and procurable on loan from Smith Kline & French Laboratories, Medical Film Center, Philadelphia 1.

This film is based on a televised clinic originally presented at the 37th meeting of the College of Physicians, Los Angeles, 1956. The course of a fatal case of respiratory acidosis is illustrated and discussed by the authors. Etiology and symptoms of this condition are examined in detail, and the importance of early recognition is emphasized. A suggested treatment program, including emergency treatment of acute cases, is outlined fully and includes demonstrations of various types of respiratory equipment. One of the chief values of this film is the dramatization of the danger of oxygen therapy in the presence of hypercapnia. In this way, many ideas are conveyed with lasting impact that could not be transmitted by the didactic approach alone. On the other hand, the pathophysiology of respiratory acidosis is well discussed with the use of helpful color charts. The determination of arterial blood pH is stressed; however, it should be remembered that an elevated arterial carbon dioxide concentration is a more specific pivotal factor in respiratory acidosis. There are minor omissions, such as carbonic anhydrase inhibitors. The physician viewing this film should bear in mind that it is probably better to give oxygen to a patient with cyanosis and watch his response to it rather than to withhold oxygen while waiting for respiratory equipment. This teaching film is highly recommended for house officers, visiting staff, and medical students.

Retropubic Prostatovesiculectomy: 16 mm., color, sound, showing time 10 minutes. Prepared by McCleery Glazier, M.D., and Louis J. Lombardo Jr., M.D., Los Angeles. Produced in 1957 by Billy Burke Productions, Hollywood. Procurable on loan from Eaton Laboratories, 17 Eaton Ave., Norwich, N. Y.

In this motion picture the operative technique of retropubic prostatovesiculectomy is demonstrated on a cadaver. The procedure is shown in detail and the advantages of the retropubic approach, particularly the excellent surgical exposure it affords, are pointed out. The author's technique for this procedure is primarily used for the surgical treatment of early prostatic carcinoma. Models are used at the beginning and end for orientation. It is an excellent film and is recommended especially for residents, interns, and urologists. It would also be of interest to general surgeons and surgical nurses.

ILLUSTRATED FILM REVIEWS

A CLINIC ON RECOGNITION AND MANAGEMENT OF RESPIRATORY ACIDOSIS

Reginald H. Smart, M.D., Hurley L. Motley, M.D., Ph.D.
and
Joseph F. Boyle, M.D., Los Angeles

Each day in hospitals in the United States, deaths due to respiratory acidosis occur among patients seen in all fields of medical and surgical practice. Although certain clinical signs should alert physicians to the presence of this condition, all too often it is unrecognized. Because these patients die a chemical death, autopsy will not demonstrate the cause. However, before death, simple, accurate laboratory procedures can be performed which will quickly establish the diagnosis and permit effective treatment. These should be available in every hospital. A brief study of the pathological physiology involved demonstrates the pathogenesis of this condition and provides the basis for prompt recognition and proper treatment. Effective therapeutic measures are available, and, *if respiratory acidosis is recognized and adequate treatment instituted in time*, the majority of these patients' lives can be saved. The written review of this film appears on page 2053 of this issue. (This film is sponsored and distributed by the Medical Film Center, Smith Kline and French Laboratories, Philadelphia 1.)

Fig. 1.—Oxygen plays lifesaving role in many instances. However, when injudiciously or improperly used, it may become instrument of death.

Fig. 2.—Case of death due to unrecognized respiratory acidosis is reviewed by attending staff and resident physician.

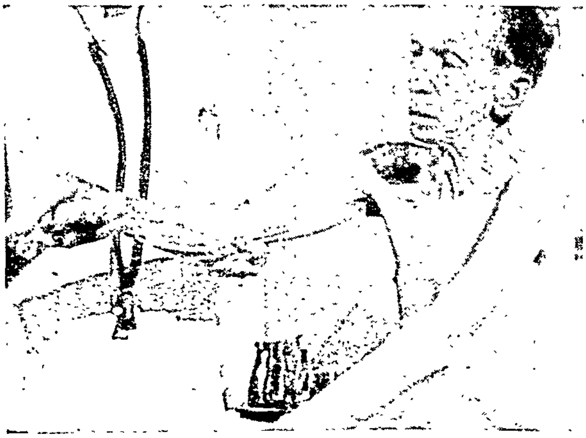


Fig. 3.—On admission to hospital, patient was dyspneic, cyanotic, and agitated. Resident ordered meperidine (Demerol) hydrochloride.

Fig. 4.—After injection, oxygen was given by mask. Cyanosis disappeared, but patient became comatose and died.

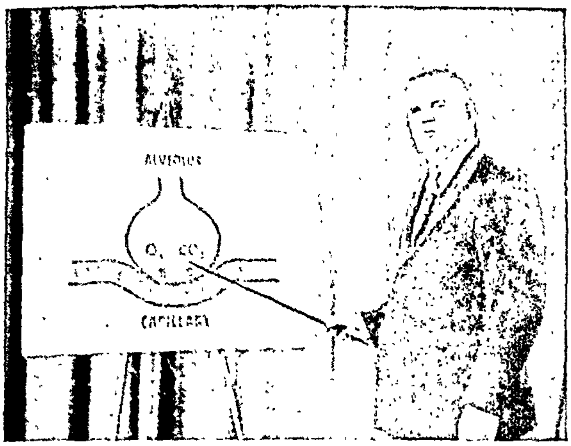


Fig. 5.—Resident suspected cerebral vascular accident, but autopsy revealed only some bronchitis and emphysema. Review of respiratory physiology explains what happened.

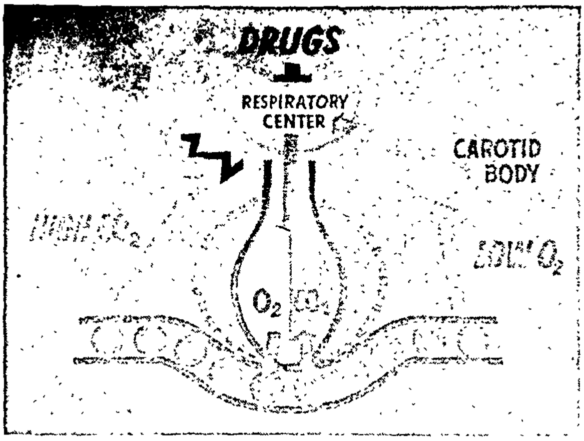


Fig. 6.—Normal response of respiratory centers can be depressed by *excessively high concentrations* of blood carbon dioxide, also by administration of barbiturates or opiates.

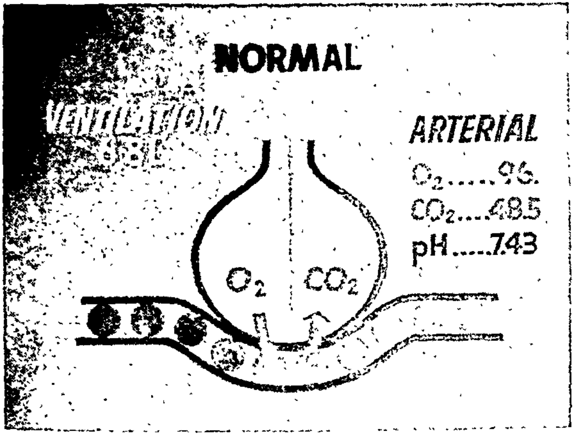


Fig. 7.—Changes in ventilation are best studied by examination of arterial blood.

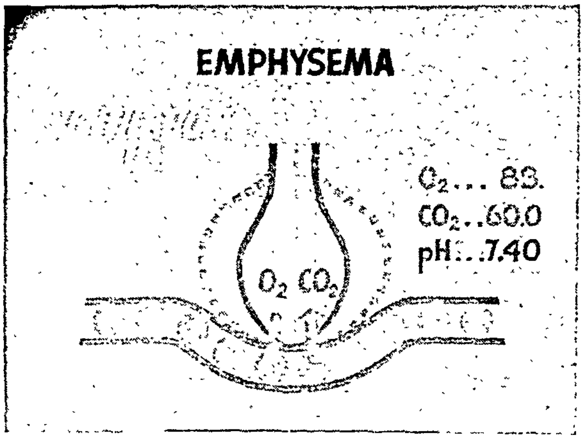


Fig. 8.—Decreased alveolar ventilation results in diminished elimination of carbon dioxide and decrease in arterial oxygen saturation.

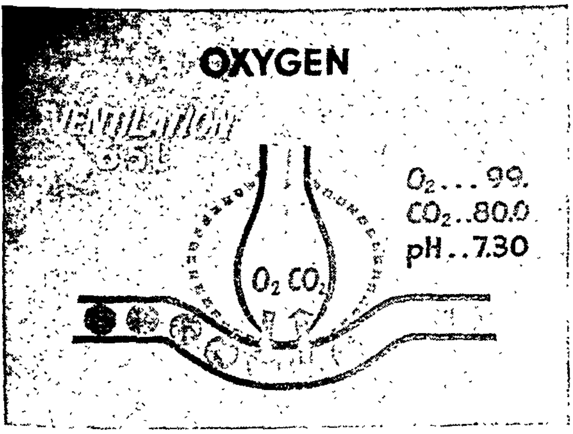


Fig. 9.—If oxygen is administered, blood becomes saturated with it and hypoxic part of stimulus to breathing is eliminated. Ventilation decreases further, more carbon dioxide accumulates, and pH falls. This is respiratory acidosis.

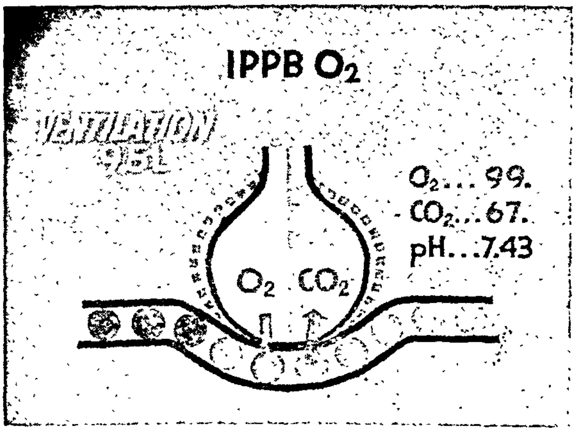


Fig. 10.—If oxygen is administered with intermittent positive pressure, the blood becomes saturated with it, alveolar ventilation is improved, carbon dioxide is better eliminated, and pH returns to normal.

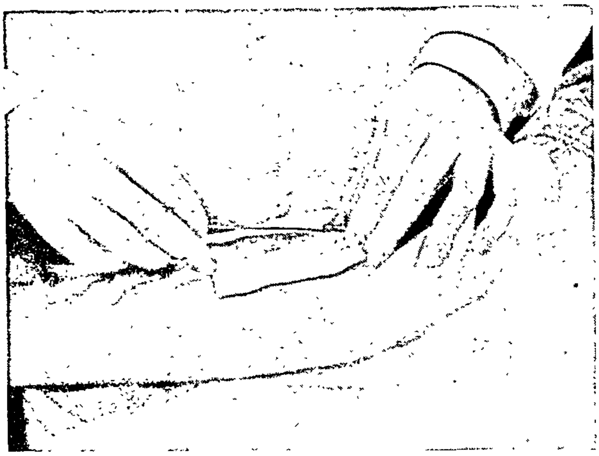


Fig. 11.—Arterial blood, not mixed venous blood, must be used. There should be intermittent spurt to verify puncture of artery.

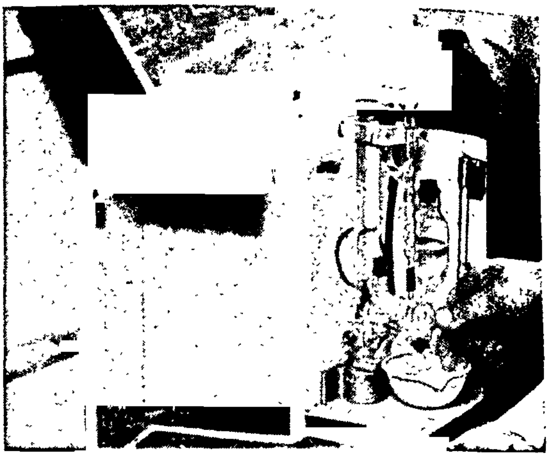


Fig. 12.—Arterial blood pH determination, with glass electrode pH meter, quickly and accurately confirms diagnosis of respiratory acidosis.

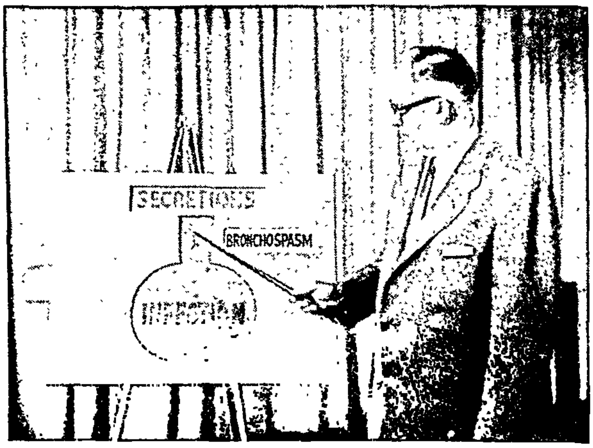


Fig. 13.—First principle of therapy is to remove obstructions to adequate airway.

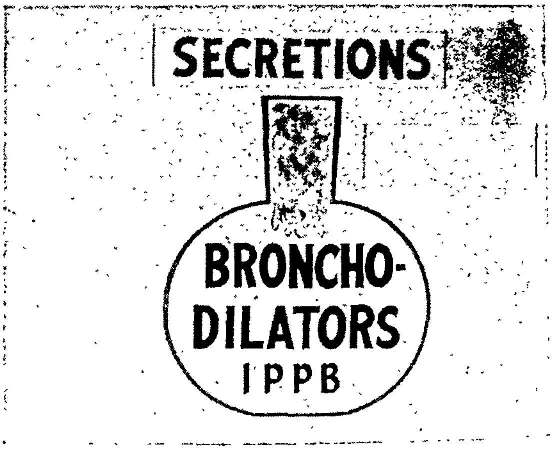


Fig. 14.—Bronchodilators and antibiotics are administered best as aerosols, and with intermittent positive-pressure breathing medicaments are carried down to areas where they will be most effective.

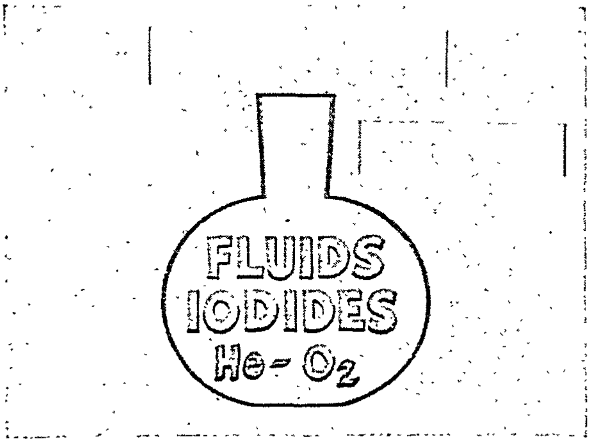


Fig. 15.—60-40% helium-oxygen mixture will improve ventilation, will carry aerosol beyond obstructing mucous plugs, and leaves inert gas with which to expel secretions and prevent atelectasis.

Fig. 16.—Another principle is to improve distribution of air in lungs and thereby augment alveolar ventilation. This can usually be done with intermittent positive-pressure breathing therapy.

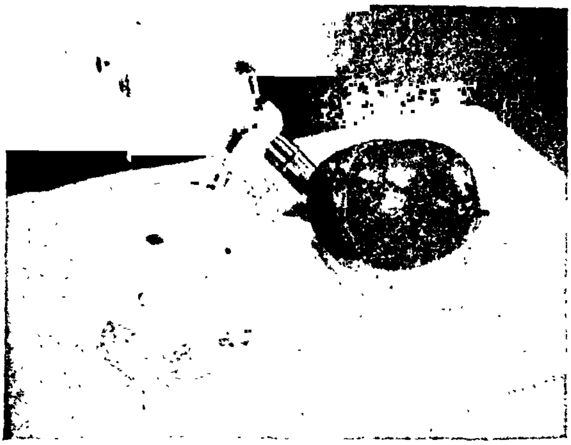


Fig. 17.—With two balloons representing alveoli, positive-pressure breathing is demonstrated effectively to overcome inadequate alveolar ventilation and improve distribution of air to otherwise poorly ventilated alveoli.

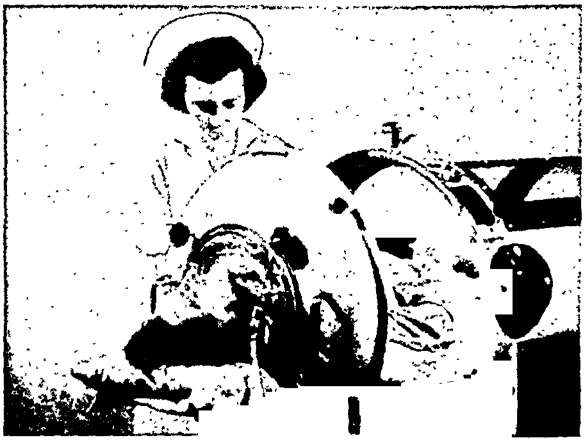


Fig. 18.—If patient cannot be ventilated adequately with portable equipment, it may be necessary to use iron lung.

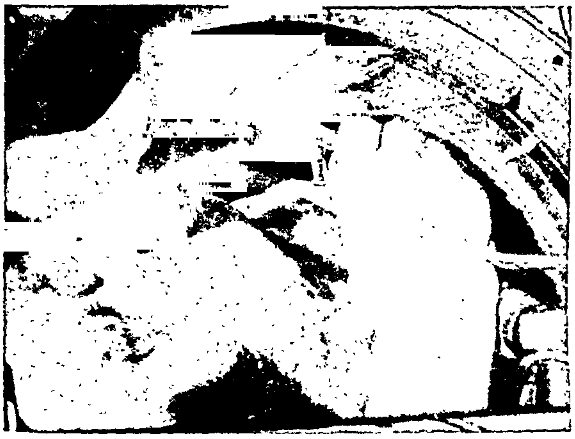


Fig. 19.—Some patients require tracheotomy to allow better aspirations of secretion and reduce "dead space."

Fig. 20.—In two or three days, this man was well enough to be taken out of respirator. In several weeks, tracheotomy tube could be removed.

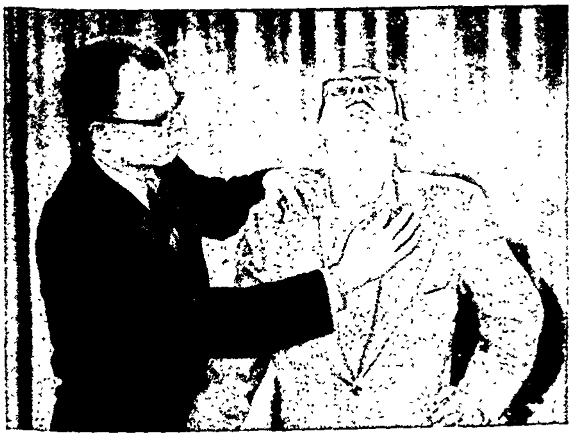


Fig. 21.—Another patient became apneic after receiving sedatives and oxygen. He was ventilated with pressure breathing through tracheotomy tube.

Fig. 22.—It was several days before he was able to breathe on his own, but he recovered, returned to work, and has had over three years of comfort.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Lung Cancer Death Rates in England and Wales Compared with Those in the U. S. A. E. C. Hammond. Brit. M. J. 2:649-654 (Sept. 13) 1958 [London].

The lung cancer death rate reported by the Registrar General for England and Wales in 1955 was 69.3 per 100,000 population for males and 10.6 per 100.000 population for females. Standardizing the lung cancer death rates reported by the National Office of Vital Statistics for the United States in 1955 to the age distribution of the population of England and Wales in 1955, the rates were only 33.0 per 100,000 population for males and 6.7 per 100,000 population for females. Thus, the lung cancer death rate reported in England and Wales for males was 2.1 times as high as that reported in the United States, and for females it was 1.6 times as high. A difference of this order of magnitude has existed in the male rates for several decades, while before 1949 there was only a small difference in the female rates.

Among both men and women in the middle-age and old-age groups there are proportionately more cigarette smokers in the United Kingdom than in the United States. On the other hand, at the present time the number of cigarettes consumed per smoker per day is higher in the United States than in the United Kingdom. The proportion of male cigarette smokers who inhale appears to be approximately the same in the 2 countries. In the United States the average length of the remaining butt after a cigarette is discarded is about 31 mm.; about 5% are 45 mm. or longer, and about 9% are under 20 mm. in length. In the United States in 1957 the main stream smoke of the average cigarette contained about 2.6 mg. of nicotine and 42.8 mg. of tar. More recently, cigarettes with a relatively low content of nicotine and tar have become increasingly popular in the United States. Data at present available do not support the hypothesis that a substantial proportion of the difference in lung cancer death rates between the United Kingdom and the United States is attributable to differences in the use of cigarettes. However, more detailed information on smoking habits and on the chemical composition of cigarette smoke in the 2 countries is needed before this can be definitely established.

In both the United Kingdom and the United States the lung cancer death rate of smokers, as well as the lung cancer death rate of nonsmokers, is higher in urban areas than in rural areas. The difference in this respect is reported to be far greater between a large city such as Liverpool and rural areas of Wales than between large cities and rural areas in the United States. However, Merseyside (which includes Liverpool) has a higher male lung cancer death rate than any other region in England and Wales, and so it cannot be considered as typical of the country as a whole. While it is possible that some of the difference in lung cancer death rates may be due to factors associated with urbanization—for example, air pollution or occupational exposures—available evidence does not suggest that these factors can account for a large part of the difference. The reported death rate from cancer, exclusive of lung cancer, declined steadily from 1931 to 1956 in England and Wales but rose slightly in the United States during the same period of time. It is possible that differences in the diagnosis and the recording of causes of death may account for a part of the difference between reported lung cancer death rates in the 2 countries.

Myxedema, Pseudomyotonia and Myotonia Congenita. L. W. Jarcho and F. H. Tyler. A. M. A. Arch. Int. Med. 102:357-366 (Sept.) 1958 [Chicago].

A 39-year-old housewife was hospitalized in the 8th month of her 8th pregnancy for prenatal care. She gave a history of goiter since the age of 15, intermittently treated with iodine. Neither thyrotoxicosis nor hypothyroidism was suggested by her history, but during her 6th pregnancy, 9 years previously, she had complained of "strangling" sensations, apparently related to growth in size of the gland. Symptoms subsided on treatment with strong iodine (Lugol's) solution. A year later, because of the appearance of a nodule in the cervical mass, slight neck tenderness, and difficulty in swallowing, a subtotal thyroidectomy was performed. An estimated 3 Gm. of the right lobe was left in situ, and the remainder of the gland was removed. Ten hours after surgical intervention the patient

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

showed typical signs of postoperative hypoparathyroid tetany, and myxedema developed two months later. Simultaneously the symptoms and signs of generalized myotonia were manifested, and electromyographic studies confirmed the diagnosis. This disorder has been differentiated from pseudomyotonia, a common feature of myxedema, and from other muscular affections occasionally seen in hypothyroid patients. Hormonal therapy greatly improved but did not entirely correct myotonia in this patient, and the effect of treatment was not sufficient to alleviate myxedema.

True myotonia was identified in 3 blood relatives of the patient and was probably present in at least 3 others, none of whom showed symptoms or signs of thyroid dysfunction. The family, therefore, appears to be affected by congenital myotonia. The condition was manifested in a mild form in the patient reported, being temporarily aggravated by myxedema. Several members of the family showed a hereditary abnormality of the skin, hyperkeratosis palmaris et plantaris. The frequent occurrence of this skin disorder in subjects with myotonia suggests that it may have a hereditary linkage to myotonia in a group of blood relatives.

Postoperative Myocardial Infarction: Report of 35 Cases. G. Feruglio, S. Bellet and H. Stone. A. M. A. Arch. Int. Med. 102:345-353 (Sept.) 1958 [Chicago].

Myocardial infarction is not an uncommon postoperative complication; it is particularly prevalent in the older age group. Thirty-five patients with postoperative myocardial infarction were selected from 21,000 patients who were subjected to surgery in the last 3 years. Twenty-two patients were men, and 13 were women. Their ages ranged from 43 to 83 years, with an average of 69 years. The electrocardiographic diagnosis obtained before surgery in 30 patients of this series was within normal limits in 7; there was slight myocardial abnormality in 10 and moderate to severe grade of myocardial abnormality in 13. Most of the patients (24) underwent major abdominal surgery. These operations were performed with the patients under the following types of anesthesia: local anesthesia (topical and infiltration) in 6 patients; spinal anesthesia with supplementation (tetracaine [Pontocaine] hydrochloride or dibucaine [Nupercaine] hydrochloride) in 3; and general anesthesia (thiopental [Pentothal], cyclopropane, or ether) in 26. The length of surgical procedure ranged from 20 minutes to 6 hours. Twenty-five patients manifested hypotensive episodes of varying length and degree during the operation or during the immediate postoperative period. The occurrence of the hypotensive state usually coincided with, or was followed by, a myocardial infarction in 29 patients. Two patients of this group were in surgical shock for several hours, 2 developed acute pulmonary edema, and 2 manifested congestive heart failure. Diagnosis of myocardial infarction was made in approximately one-third of the group on the day of operation, in one-third within the first 3 days, and in the remaining one-third between the 4th and the 6th day of the postoperative period. Eleven patients (31.4%) died within 10 days after the onset of the myocardial infarction. In all these patients death was directly related to this state. Autopsy performed on 6 of these patients confirmed clinical diagnosis. The clinical course in most of the patients who survived was rather mild; in 6 the electrocardiograms returned to normal within 10 to 16 days.

The treatment of patients with postoperative myocardial infarction is similar to that of myocardial infarction unrelated to surgical procedure. However, certain complicating factors are involved. In patients of the older age group, and in the presence of preexisting coronary artery or other thromboembolic disease, unless specific contraindication exists, prophylactic anticoagulants administered from the 3rd to the 10th postoperative day may be of help. The prevention of postoperative myocardial infarction is one of the important problems in surgery today. The measures already employed include optimum preparation of the patient from the standpoint of heart failure, arrhythmias, anemia, electrolyte imbalance, decrease of anxiety, and performance of the operation with a minimal degree of tissue damage, anoxia, and blood loss. Hypotension should be avoided where possible. When it occurs, early recognition should be made and immediate therapy with vasopressor agents and transfusions instituted, if necessary. The longer the duration of the hypotensive state, the greater is the likelihood of the development of myocardial infarction and the greater its extent. Routine electrocardiograms should be taken during the postoperative period, particularly in the group in which complications tend to occur. In older patients the prognosis in extensive infarction is poor. Early diagnosis and appropriate therapy may be of help in decreasing the mortality from this process.

Pulmonary Infiltration and Fibrosis of Unknown Origin: The Risk of Developing Active Pulmonary Tuberculosis. J. F. Chase, S. D. Rockoff and L. P. Hellman. A. M. A. Arch. Int. Med. 102:367-374 (Sept.) 1958 [Chicago].

It is difficult to determine the significance of roentgenographically unchanging pulmonary lesions in persons with inconclusive bacteriological and pathological findings The problem of the diagnosis of these cases is of special importance to the Armed Forces where intimate environmental situations exist. In an attempt to define the risk of development of active pulmonary tuberculosis in persons with predominantly noncalcified pulmonary lesions, proved by clinical study to be "stable" or "inactive," a study group of 268 Naval and Marine Corps personnel, who were hospitalized and returned to duty in 1951 with a diagnosis of pulmonary infiltration or fibrosis of unknown origin, were followed for 3 years. All patients who had had a diagnosis of active tuberculosis during or prior to 1951 were excluded. A control group consisting of 493 Naval and Marine Corps personnel, who were hospitalized and returned to duty in 1951 with a diagnosis of hemorrhoids, were also followed for 3 years. These subjects were chosen, because there is no known relationship between hemorrhoids and tuberculosis, and the over-all age distribution was similar to that of the study group. Tuberculosis has not occurred in any member of the control group, whereas active pulmonary tuberculosis developed in 16 of the subjects of the study group (5.9%), in several of whom the diagnosis was made within 8 months after the 1951 hospitalization. Examination of the records and roentgenograms revealed that in all 16 patients the active disease process occurred in the same area of the lung which had been clinically investigated at the patients' previous hospitalization.

The high incidence of active pulmonary tuberculosis in persons with pulmonary lesions diagnosed as mostly noncalcified "inactive" pulmonary infiltrations, or fibrosis of undetermined origin, illustrates the error of assuming that such lesions have no clinical significance. The problem of early diagnosis in these subjects can be solved only by frequent and thorough follow-up examinations over a prolonged period, and for this purpose the establishment of a standardized procedure of examination and a central registry of case reports appears to be advisable.

Regional Enteritis: I. Clinical Aspects and Diagnosis in 100 Patients. J. E. Daffner and C. H. Brown. Ann. Int. Med. 49:580-594 (Sept.) 1958 [Lancaster, Pa.]

The authors report on 53 male and 47 female patients, between the ages of 16 and 70 years, with regional enteritis who were seen in the department of gastroenterology of the Cleveland Clinic between 1946 and 1956. Fifty-five of the 100 patients were less than 31 years of age, the disease being predominantly one of young adults. It occurs in older patients, though, since 15 patients were over 50 years of age. The symptoms initially may be mild and may be present for a long time before the diagnosis is made; the average duration of symptoms in the 100 patients was 2.9 years. The chief symptoms were colic or abdominal pain in 88 patients, diarrhea in 81, loss of weight in 70, gastrointestinal bleeding in 34, draining sinus in 33, fever in 32, and anal fistula in 14. Many patients initially had only one symptom, and a few had all the symptoms listed. Physical examination revealed fistulas in 48 patients, an abdominal mass in 35, signs and symptoms of partial obstruction of the small intestine in 30, and abscesses in 15. The ileum was involved in 98 patients. Systemic complications were not so frequent as they are in ulcerative colitis, and they usually subsided with adequate treatment of the regional enteritis.

Roentgenologic findings on barium enema examination were diagnostic in 85 patients and falsely normal in 4; 11 patients did not undergo this examination. Roentgenologic examination of patients with regional enteritis should include a flat plate of the abdomen to detect possible obstruction, and barium enema studies should follow. Since the ileum is so frequently involved, findings on barium enema study may be diagnostic. Motility studies of the small intestine should then be done to determine the degree and extent of the disease. The diagnosis of regional enteritis could be made earlier in the course of the disease if there were a greater awareness of the signs and symptoms of the disease. A patient may have only one of the typical symptoms or findings, but that alone should indicate the possible presence of regional enteritis. The greater the number of typical symptoms or findings in a patient, the more likely is the diagnosis to be regional enteritis. If the clinical findings strongly suggest regional enteritis, the diagnosis should be made even when the roentgenologic findings are normal.

Regional Enteritis: II. Results of Medical and Surgical Treatment in 100 patients. C. H. Brown and J. E. Daffner. Ann. Int. Med. 49:595-606 (Sept.) 1958 [Lancaster, Pa.].

Of the 100 patients reported on in the preceding paper, 35 received only medical treatment and 65 were subjected to surgical treatment. Fourteen of the 100 patients were followed up for less than one year. The remaining 86 patients were followed for periods ranging from 1 to 12 years; the average follow-up period in these patients was 5.2 years. Twenty-three of the 35 medically treated patients showed a satisfactory response, 3 an unsatisfactory response, and 9 were followed for less than one year. The effects of specific drugs given to these patients were difficult to establish, but apparently oxytetracycline (Terramycin) was beneficial in 4 patients and streptomycin in 5. Steroid therapy was of help in 5 of 10 patients, and roentgenotherapy in 3 of 6 patients. These findings suggest that medical therapy can be of benefit in patients with regional enteritis who have no severe complications which require surgical treatment.

All the 65 patients who were operated on had complications of regional enteritis; 30 had intestinal obstruction, 25 had fistulas, 13 had abscesses, and 9 had severe anemia or hemorrhage. The indications for surgical treatment were these complications of the disease rather than the disease itself.

Sixty of the 65 patients were followed for more than one year; 28 of the 60 had resection and 32 had ileocolostomy with or without exclusion, ileostomy, or enteroenterostomy respectively. The results of operation were good in 32 patients, fair in 14, and poor in 12; 2 patients died, but these 2 deaths were not related to the enteritis. Of the 28 patients subjected to resection, 20 had good results, 3 had fair results, 4 had poor results, and 1 died. The postoperative recurrence rate was high: 63% for the entire group and 54% for the group of patients who underwent resection. Of the 38 patients with postoperative recurrence, 18 were treated medically and 20 underwent a second operation. Two of the 38 patients were lost to follow-up. Thirty-one of the remaining 36 patients responded satisfactorily to the further treatment. The results obtained in this series of 100 patients warrant an optimistic approach to the treatment of regional enteritis.

Viremia in Human Mumps Virus Infections. J. R. Overman. A. M. A. Arch. Int. Med. 102:354-356 (Sept.) 1958 [Chicago].

The various complications which may follow mumps parotitis, such as meningoencephalitis and orchitis, suggest that the virus is widely disseminated throughout the body, but viremia has previously been demonstrated by only one worker in a patient with this contagious disease. Mumps virus is easily recovered from the spinal fluid and has recently been demonstrated in the urine. The present paper reports 3 successful isolations of this virus from the serum of 2 of 15 patients with mumps virus infections. Serum antibodies to mumps virus had not yet appeared in the blood of these patients at the time the virus was isolated. The reason why mumps virus can so rarely be isolated from the serum of patients with mumps virus infections is still unknown.

Diazotization Rate of Bilirubin Content of Blood as a Diagnostic Aid in Biliary Colic. L. Schalm. Nederl. tijdschr. geneesk. 102:1537-1539 (Aug. 9) 1958 (In Dutch) [Amsterdam].

If gallstones are present in a patient who complains of epigastric pain, it is important to ascertain whether these calculi account for the symptoms, particularly if the patient shows no signs of jaundice. It is important to determine in such patients the bilirubin level of the blood, particularly the percentage of bilirubin diazotized in 10 minutes. The author calls attention to a method which he, together with Schulte, described in 1950 and in 1953. On the basis of illustrating case histories he shows that, if soon after the attack of epigastric pain there is a noticeable rise in the total bilirubin content of the blood with a considerable increase in the 10-minute diazotization rate, this positive reaction is strongly indicative of cholelithiasis as a cause of the symptoms. The case of a patient with a stone present in one of the hepatic ducts showed that determination of the alkaline phosphatase value may constitute a further refinement of the diagnosis.

Wilson's Disease, Especially with Regard to Biochemical Disturbances. E. Enger. Tidsskr. norske lægefor. 78:781-784 (Aug. 15) 1958 (In Norwegian) [Oslo].

In hepatolenticular degeneration (Wilson's disease), a rare hereditary disease due to disturbances in copper metabolism, copper is deposited in the tissues. The plasma content of copper and ceruloplasmin is reduced. The ceruloplasmin reduction is constant and considerable; the reduction in the copper content is variable and less marked, which leads to increase in the amount of copper not bound to the ceruloplasmin. The increase in the diffusible copper fraction predisposes to metal deposit in organs with greater affinity to copper than the serum albumin has. This affects particularly brain, liver, kidneys, and cornea. Another diagnostically significant biochemical deviation is the considerably increased copper excretion in the urine. Disturbances in the copper metabolism depend on genetic defects. Heredity is recessive. In about 75% of the cases, the clinical picture is dominated by damage to the brain; in most of these cases there is simultaneous hepatic damage. In about 20% of the cases, cirrhosis of the liver stamps the picture, but sooner or later signs of damage to the brain appear. In the remaining 5%, the so-called abdominal form of Wilson's disease, simultaneous involvement of the brain is not demonstrable.

Biochemical examination will disclose the pathological copper metabolism of Wilson's disease. Kayser-Fleischer rings in the cornea, seen only in this condition, are present in from 60 to 90% of the cases. The first symptoms, as a rule, appear between the ages of 15 and 25 years, but the debut may come in early childhood or later. Death usually occurs in from 2 to 4 years; acute cases of a few months' duration are not rare, and a chronic course has been reported. In 1951 increased excretion of copper in the urine on administration of dimercaprol (BAL) was reported. Penicillamine and Versene, recently introduced, cause a stronger copper excretion than BAL. Treatment with these medicaments has given clinical improvement even in cases with the fully developed picture. Lasting improvement can hardly be hoped for in advanced cases. Ceruloplasmin examinations, however, afford the possibility of revealing the disease in clinically well persons; here good results of treatment can be looked for.

The author reports the case of a man, aged 35 years, in whom Wilson's disease was diagnosed on signs of hepatocerebral damage, Kayser-Fleischer rings in the cornea, reduced uric acid level, increased elimination of amino acids and copper in the urine, and increased copper content in the tissues. Treatment with BAL was without avail. The patient died 7 months after the initial symptoms. The histological results confirmed the clinical diagnosis. The pattern here deviated from the usual in that the serum ceruloplasmin was normal. The author concludes that in advanced cases the biochemical disturbance can become so complicated that the usual reduction in the ceruloplasmin content of the serum is masked.

SURGERY

Treatment of Severe Head Injuries. I. N. Maciver, L. P. Lassman, C. W. Thomson and I. McLeod. Lancet 2:544-550 (Sept. 13) 1958 [London].

The development of decerebrate rigidity and hyperpyrexia, either separately or together, in patients who have sustained severe head injuries must be regarded as ominous. A retrospective survey showed that in cases of this type the mortality was 77%. The adoption in December, 1956, of a method of treatment designed to counteract respiratory insufficiency and to prevent or relieve cerebral edema brought about a statistically significant reduction of this mortality to 38.4%. The most important features of the treatment (which is described in detail by the authors) are (1) correct posture to prevent seepage into the lungs and tracheobronchial tubes; (2) isolation of the lungs from the disorganized pharynx by early tracheotomy; (3) further protection of the lungs by continued aseptic tracheobronchial toilet; (4) use of a lytic cocktail to coordinate the reticular mechanisms of the brain stem and to control rigidity, restlessness, and hyperthermia; (5) avoidance of oral feeding during unconsciousness; (6) maintenance of physiological tensions of oxygen and carbon dioxide in the blood; (7) maintenance of fluid and electrolyte balance and calorie intake; (8) use of antibiotics to combat infection; and (9) relief or prevention of secondary cerebral edema by the intravenous administration of triple plasma.

The clinical picture in the 26 patients treated by this method and in a control group of 56 patients meeting the same diagnostic criteria varied according to the degree of damage to or compression of the brain stem. The best prognosis attended the cases in which the patients showed hyperpyrexia with tonic fits superimposed on decerebrate rigidity. The poorest prognosis accompanied the cases marked by complete thermolability and absolute flaccidity save when disturbed by feeble tonic fits. Medullary failure was imminent in the thermolabile and flaccid group, the blood pressure falling and the respirations becoming shallow, irregular, and gasping. Nevertheless, 2 patients with this clinical picture survived.

All 16 of the surviving patients in the treated group are under constant observation and have been subjected to psychological testing at regular intervals. Two women have shown fairly pronounced mental changes for some time, and one man is somewhat euphoric and a little childish, but he is extremely good-tempered and works well. Relatively few of the others have any physical or neurological deficit; 9 have returned to their pre-accident occupations and are managing well; 2 have gone back to light work, and both should return to their normal employment within a reasonable time; and 4 others either are or will presently be fit for light work.

Further improvements may make it possible to lower the mortality in patients with severe head injuries to 20%, but only if it is realized that respiratory insufficiency exists from the time of the accident and that steps must be taken at once to counteract it, both during transportation to a hospital or head-injury center and on arrival at a casualty department.

The Successful Removal of a Tumor from the Right Atrium Under Hypothermia. M. Krčílková, I. Musil, J. Navrátil and O. Olejník. Thorax 13:173-176 (Sept.) 1958 [London].

The authors report on a 14-year-old girl who was admitted to the surgical department of the University Hospital in Brno, Czechoslovakia, because of severe dyspnea and elevated erythrocyte sedimentation rate. Gross systolic distention of the jugular veins was noticed. There was a slight prominence of the chest in the precordial region and marked systolic pulsation of the right ventricle. The liver was enlarged. The heart sounds were indistinct, and a systolic murmur was heard in the 5th intercostal space, loudest near the right sternal border. The electrocardiographic tracing showed right bundle-branch block and right ventricular overload. A posteroanterior chest roentgenogram revealed enlargement of the right ventricle with expansile systolic pulsation of the right atrium. Both venae cavae were enlarged and showed intense distention during systole. Fluoroscopy revealed a dense, well-circumscribed, ball-shaped, and plum-sized mass within the shadow of the right atrium after the systolic and diastolic movement of the right heart in a quick, sometimes irregular, swinging curve. An angiocardiogram was made, which showed a defect in the contrast medium filling the right atrium and corresponding to the ball-like mass.

The patient was operated on with the aid of hypothermia at a lowest temperature of 80.6 F (27 C). A tumor mass measuring 4 by 5 by 5.5 cm.

and hanging on a stalk, which originated from the inferior part of the right atrial septum close to the posterior cusp of the tricuspid valve, was removed from the right atrium by division of its stalk. The postoperative period was uneventful, and the patient was discharged from the hospital 4 months after the operation. Microscopic examination of the surgical specimen revealed a tumor with myxomatous and fibrotic changes and with frequent calcification.

Primary tumors of the heart are rare, and in most of the cases collected from the literature the diagnosis was made at autopsy. It is to be expected that in the future cardiac tumors will be diagnosed more frequently during the patient's life and before operation, thanks to diagnostic improvements in cardiology and roentgenography.

The Follow-Up Study of 250 Patients Subjected to Surgical Treatment of Patent Ductus Arteriosus. N. Helsingen Jr., O. Husom and L. Efskind. Thorax 13:210-212 (Sept.) 1958 [London].

The authors report on 250 patients, between the ages of 14 months and 40 years, with patent ductus arteriosus who were operated on in the surgical department of the Rikshospitalet (surgical clinic of the University) in Oslo between 1944 and 1956. Except for the first 2 patients operated on, all had the usual dorsolateral transthoracic incision with wide opening of the thorax, and, as a rule, simple ligation of the ductus arteriosus was performed with 2 or 3 thick silk ligatures applied as far apart as possible. In 5 patients the duct was cut between clamps and sutured, and in 4 others sutures had to be placed on the aortic and pulmonary ends of the duct but without division. Three patients died, representing a mortality rate of 1.2%. Of the 3 deaths, one was attributable to accidental bleeding in the course of the operation; the second occurred during reoperation for a complicating aneurysm; and the third was caused by a tension pneumothorax occurring after a simple thoracentesis.

The patients were followed up for periods varying from 6 months to 13 years. All the patients were traced. The results of the surgical treatment were extremely satisfactory. The crucial point in the follow-up examination is the detection of patients with possible recanalization of the ductus arteriosus. In only 4 patients, 2 children, aged 8 and 12 years, and 2 adults, aged 29 and 23 years, could a continuous murmur of the "patent duct type" be heard at the follow-up examination, indicating recanalization. All 4 patients had had simple ligation of the ductus arteriosus. Three had wide ducts, and one probably had a subacute bacterial endarteritis postoperatively. The incidence of recurrence thus was 1.6%. This compared favorably with the reports by other workers of more than 10% recanalization after ligation of the ductus arteriosus. Under these conditions simple ligation is considered a safe procedure with a small chance of recurrence, except in patients with giant ducts and in elderly patients.

Results of Open Heart Surgery with Elective Cardiac Arrest by Potassium Citrate in Patients with Congenital and Acquired Heart Disease. F. M. Sones Jr. Dis. Chest 34:299-316 (Sept.) 1958 [Chicago].

Elective cardiac arrest, accomplished by perfusion of potassium citrate solution into the coronary circulation, made possible excellent surgical exposure of intracardiac structures during open cardiotomy in 80 patients with a variety of congenital and acquired lesions. The cardioplegic effect of potassium was reversed by perfusing the coronary arteries with oxygenated blood. In no instance was death or surgical failure attributable to the use of cardiac arrest. Forty-five patients survived. The postoperative status of surviving patients was evaluated on the basis of clinical findings and, when possible, by heart catheterization and cinecardioangiography 6 to 14 months after the operation. Anatomic correction with restoration of normal function may be anticipated in patients with atrial or ventricular septal defects, provided that complete absence of the septum is not encountered.

Severe pulmonary hypertension is not a contraindication to closure of septal defects if there is a large left-to-right shunt with increased pulmonary flow. In patients with the tetralogy of Fallot, inadequate closure of the ventricular septal defect has been found in most instances when a prosthesis has not been incorporated into the defect. These patients have shown clear-cut evidence of functional improvement, with increased pulmonary blood flow and relief of arterial hypoxemia, but anatomic correction and restoration of normal cardiovascular dynamics have usually not been obtained. Experience with this small group of patients emphasizes the need for further refinements in diagnosis, surgical technique, artificial perfusion, and postoperative management before the ultimate potential of open heart surgery may be realized.

Results of Treatment of Cystic Disease of the Breast: Five- to Eighteen-Year Survey. J. W. Hendrick. Surgery 44:457-482 (Sept.) 1958 [St. Louis].

This report is concerned with the clinical histories, operative findings, pathological reports, treatment administered, and follow-up examinations on 90% of a series of 484 private women patients treated for cystic disease of the breast between 1933 and 1951. The study was undertaken to determine the results of conservative therapy and to present clues to the etiology of cystic disease, particularly hormone influences, and the relation of this disease and breast cancer. Research has demonstrated that estrogenic stimulation over a period of time in ovariectomized mice will produce proliferation and metaplasia of the mammary duct epithelium, with dilatation of the ducts and acini and the formation of microcysts. This histological picture in mice is comparable to cystic disease in the human. The extensive use of estrogens in all forms for so-called menopausal symptoms in patients with nervous phenomena certainly should increase the incidence of cystic disease and carcinoma of the breast if the theory could be proved that estrogenic stimulation is related to malignancy of the breast. Since 1940, at least 60% of the patients in whom the author made a diagnosis of cystic disease or carcinoma of the breast had histories of having had estrogenic therapy in varying amounts over a period of months to several years. A number of these patients who were past the menopause stated that their breasts had been free of symptoms until the administration of estrogen therapy, after which their breasts became tender, tense, painful, firm, and nodular.

A follow-up of this series of 484 patients with cystic disease for a period of 5 to 18 years disclosed that carcinoma of the breast developed in only 4. Of 452 patients with primary carcinoma of the breast who were treated during the same period, 4 had previously undergone surgery elsewhere for benign lesions of the breast. Since some authors believe cystic disease of the breast to be a precancerous lesion and recommend mastectomy for its treatment, the question arises: What advice is the physician to give patients who consult him with painful, nodular breasts? It is the author's practice to assure the patient that there is no more likelihood of carcinoma developing in her breast than in that of any patient of comparable age without cystic disease and that mastectomy is not necessary except in rare cases. Since 1933 he has used aspiration therapy for discrete cysts of the breast, provided that the patient agrees to return at regular intervals for further evaluation. Only 7 of 167 patients with discrete lumps treated by aspiration had a residual mass after dry aspiration. Surgical excision of the residual tumors proved that they were benign in all 7. Patients with discrete cysts are advised that, if aspiration produces bloody fluid, if the lump does not completely disappear after aspiration, if fluid is not obtained, or in the event that the lump returns after a second aspiration, the involved area of breast will be excised for histological examination. Regular follow-up examinations of patients in whom aspiration was performed demonstrated that carcinoma was not overlooked in any instance.

Of 314 patients who had either a discrete cyst or an area of cystic disease localized to one segment of the breast, 311 underwent surgical excision of the involved area, whereas the other 3 patients required simple mastectomy due to severe mastodynia and the fact that the involved breasts were riddled with small cysts. In 67 patients treated by aspiration or surgical excision of a discrete cyst or segment of breast affected with cystic disease, a second cyst developed in the same or opposite breast after a period of several months to 16 years. The new cysts were successfully treated by aspiration therapy.

Statistics of Gallstones: Indications for Cholecystectomy. N. Enderlin. Schweiz. med. Wchnschr. 88:855-858 (Aug. 30) 1958 (In German) [Basel, Switzerland].

A total of 6,400 autopsy reports of the age groups over 10 years, which covered the period between 1950 and 1954, were reviewed at the Pathological Institute of the University of Zurich. The 6,400 patients included 1,000 who either had gallstones (898) or had undergone cholecystectomy (102). Thus, only about 10% of gallstone patients had been subjected to cholecystectomy. About 1 woman in 5 and 1 man in 10 had gallstones. The number of patients with gallstones rapidly increased after the age of 30, and it reached a maximum in the 7th and 8th decades. Generalized obesity existed in one-third of the patients with gallstones, and one-fourth had hypertension. Eight per cent had diabetes, which represents an increased incidence, since the average diabetes mellitus morbidity in the total population ranges from 0.25 to 0.4%.

Complications of cholelithiasis existed in 402 of the 1,000 patients, while the remaining 60% were free from pathologically demonstrable gallstone complications. Expressed in percentage rates, 20.4% had chronic cholecystitis; 6%, contracted gallbladder; 5.3%, cholangitis; 5.1%, biliary cirrhosis of the liver; 4.4%, pancreatitis; 3%, perforation of the gallbladder; 2.2%, liver abscess; 2%, empyema of the gallbladder; 1.7%, ectasia of the gallbladder; 1.5%, acute cholecystitis; 1.5%, hydrops of the gallbladder; and 1.3%, strawberry gallbladder. The complications of cholelithiasis were the only cause of death in 8.7% of the patients, and in an additional 7.8% they were a contributing cause. In the remaining 83.5% of the patients no causal connection existed between the gallstone disease and death.

The author feels that his statistical analysis suggests that patients with complications involving inflammation or an obstruction to bile drainage should be subjected to cholecystectomy. Surgeons generally suggest that the operation be carried out even before complications develop, inasmuch as the surgical mortality is only 0.6% in patients who are as yet free from complications, whereas after their development and at the more advanced ages it may reach 20%. The author feels that balanced judgment with a consideration of personal and individual factors is to be preferred to a purely statistical evaluation in deciding on a cholecystectomy. He believes that the operation is definitely indicated when the presence of gallstones is complicated by acute or chronic inflammation, by pancreatitis, and by processes that obstruct bile drainage. Relative indications for cholecystectomy are recurrent gallstone colics without jaundice or fever, epigastric discomfort, nausea, multiple small stones, and stones in young persons, particularly young women likely to become pregnant. In these instances the physician may recommend cholecystectomy but should leave the final decision to the patient. In patients with silent gallstones or with only minor complaints and a single attack of stone colic, an expectant attitude is justified.

Acute Pneumocholecystitis. R. Consoni, P. Tavares and H. Prisco. Rev. Assoc. med. brasil. 4:117-120 (June) 1958 (In Portuguese) [São Paulo, Brazil].

Acute pneumocholecystitis is due to the presence of gas-producing bacteria of the Clostridium genus in the lumen of the gallbladder. Pathogenicity of the bacteria greatly increases from contact with concentrated bile immediately after obstruction of the cystic duct by calculi, regional enlarged lymph nodes, adhesions, or the presence of abnormal regional blood vessels. The symptoms are those of acute cholecystitis, but they are even more acute. A roentgenologic diagnosis of pneumocholecystitis can be made within 24 or 48 hours after the appearance of the acute symptoms from the typical image of the gallbladder showing gas retention.

The authors review 22 cases from the literature and add 2 cases of patients whom they have observed. The disease was more frequent in patients between the ages of 50 and 60 years. There were 19 women and 5 men. Six patients had diabetes. A cholecystectomy was performed on 16 patients. In most of these the gallbladder was found to be necrotic or gangrenous. Often it was perforated, with diffusion of gas into the perivesicular tissues, or else there was a diffuse peritonitis from anaerobic bacteria. Twelve of the 16 patients who had a cholecystectomy recovered; 4 died of postoperative complications.

The authors advise systematic simple roentgenray examination of the upper quadrant of the abdomen in patients suspected of acute cholecystitis, for a roentgenologic diagnosis of acute pneumocholecystitis. Cholecystectomy is the treatment of choice. Conservative treatment should be reserved only for patients who seem to be poor operative risks. Even for these patients, the surgeon should be prepared for cholecystectomy if the clinical symptoms progress and daily roentgen-ray examination of the gallbladder shows increased size in gas contents or diffusion of gas into perivesicular tissues.

Surgical Management of Complicated Diverticulitis. B. P. Colcock. New England J. Med. 259:570-573 (Sept. 18) 1958 [Boston].

The author reports on 74 men and 57 women, between the ages of 30 and 77 years, with diverticulitis who were operated on at the Lahey Clinic in Boston between 1947 and 1958. Seventy-four (56.6%) of the 131 patients had had symptoms of the disease for one year or longer before the surgical intervention. Of the 131 patients, 69 (52.6%) had a one-stage resection with a primary anastomosis, 17 had a two-stage resection, 3 had a Mikulicz resection, 27 had a three-stage resection, 8 had resection combined with closure of colostomy, and 7 had other operative procedures. The length of hospital stay for patients having a one-stage resection ranged from 9 to 24 days, with an average period of 15 days. In patients having a three-stage resection, the hospital stay ranged from 37 to 84 days, with an average of 60 days. Two patients who underwent a two-stage resection died, representing a mortality rate of 1.5%. No deaths occurred in the other groups of patients.

Forty patients (30.5%) had previously undergone one or more surgical procedures that did not relieve symptoms or that led to further complications. Thus, inadequate surgery is one factor responsible for many complications associated with the surgical treatment of diverticulitis. In only 2 patients did an attempt at definitive surgical treatment fail when the accepted way of treating a complication of diverticulitis was employed—that is, colostomy, followed by resection and closure of the stoma. In the other 38 patients failure was attributed to the use of unsatisfactory surgical procedures that are known to be associated with a high incidence of poor results. One patient had a total of 8 operative procedures before cure was obtained. Patients with relatively uncomplicated diverticulitis may be subjected to definitive surgery, with a single operative procedure, a short period in the hospital, and a low mortality. Resection of the diseased intestine stops the recurrent attacks; perforation, obstruction, and fistula formation are avoided; and the danger of allowing unsuspected carcinoma to go untreated is eliminated.

Observations on Intraperitoneal Adhesions: An Experimental Study. B. B. Jackson. Surgery 44:507-514 (Sept.) 1958 [St. Louis].

The observations described represent a pathophysiological study of the natural evolution of intestinal adhesions as visualized through a transparent plastic window in the abdominal wall of the dog. Eight dogs, weighing at least 20 kg. (44 lb.), were used. A 6-by-8-cm. elliptical Plexiglas window, with a 90 to 92% light transmission and a haze of 5 to 10%, was utilized, being contour-shaped for each dog. A screw tap was placed at one end of the window, so that measurements could be taken or fluid aspirated without removing the window. A stainless steel foundation mesh was sutured around the window with wire. After the rectus muscles had been excised, the window was sutured between the anterior and posterior fascial sheaths. Sterilization of the window was accomplished with 1:1,000 Zephiran solution for 24 hours. The natural history of the postlaparotomy adhesion appears to be trauma, capillary dilatation, stasis, increased capillary permeability, fluid loss, fibrinous exudate, decrease in pulsations in the vasa rectae, relative anoxemia, diminution in peristalsis, release of proteolytic enzymes from white blood cells, increase in intraperitoneal fluid, resorption of fibrin, recanalization of capillaries, return of arterial pulsations, and resumption of peristalsis.

The extent of the adhesion is directly proportional to the injury, whether it be chemical, bacterial, thermal, or mechanical. Peritonitis productive of heavy fibrinous exudate frequently results in broad, vascular, permanent, fibrous adhesions. Blood, free or clotted, in the peritoneal cavity does not incite the formation of adhesions but provides an excellent medium for bacterial contamination which may subsequently be responsible for numerous dense adhesions. Heparin inhibits adhesions only before the stage of fibrinous deposition, whereas streptokinase which activates fibrinolysin destroys the early fibrinous film. Those agents tend to inhibit localization of infection when they are used intraperitoneally. Induced intestinal hypermotility to prevent adhesions seems to perpetuate a normal tissue response to injury. The hyperactivity tends to increase the ischemia of the intestinal wall, which prolongs the phase of capillary transudation. The Plexiglas window provokes adhesion development and reperitonealization in 20 to 30 days. The evolution of the uncomplicated intraperitoneal fibrinous adhesion lasts approximately 48 to 96 hours. Efforts to shorten this period appear to complicate a natural healing phenomenon with longer period of adynamic ileus and/or the development of permanent fibrous adhesions.

Control of Surgical Infections at the Minneapolis General Hospital: A Two Year Study. C. R. Hitchcock, H. Harder, M. Panuska and others. Surgery 44:492-506 (Sept.) 1958 [St. Louis].

During the early summer of 1956 the surgical staff at the Minneapolis General Hospital became alarmed over the mounting number of "clean" surgical wounds infected with staphylococci, and a study was organized. This paper deals with investigations extending over a period of 25 months. The committee on infections included the superintendent, the chief of surgery, a representative from the department of medicine, the chief operating-room nurse and her assistant, the research bacteriology technician, the pathologist, the director of housekeeping, and the chief engineer. The investigators had access to records of infections on the surgical services for an 8-month period prior to the formation of this committee. The hospital investigated serves as an emergency center and as an outpatient and inpatient facility. During the course of a year it treats approximately 45,000 persons on a total of about 110,000 hospital visits or admissions. The preponderance of older and debilitated patients on the inpatient services greatly heightens the risk of serious infections. In one year (1955) 648 patients were seen in the emergency room with infections requiring either outpatient treatment or admission to the hospital.

The authors believe that all changes instituted during the past 18 months have contributed in some measure toward better control of wound infections. The following remedial measures appeared to be of significance: 1. Monthly meetings of the committee reviewed the reports on all patients with wound infections, and the tabulation of these problems on the surgical services permitted statistical analysis of the results. 2. In the absence of adequate facilities for complete isolation of all patients infected with staphylococci, the prevention of cross contamination on the open wards was aided by stopping the interchange of blankets and fomites among patients and by improving dressing techniques. 3. The preoperative skin preparation was changed from soap or hexachlorophene solution and aqueous Zephiran to ether and alcohol and tincture of Zephiran; during the latter phases of this study Dreft replaced the initial ether rinse, and the results appear to be satisfactory. 4. Improvements in housekeeping procedures both in the operating rooms and on the surgical wards were of value.

During the early phases of this study an improvement of 620% was made in the staphylococcic infection rate of clean wounds, and the improvement has continued to date. At present the over-all infection rate is less than 2%. Bacteriological sensitivity studies have yielded a common pattern of antibiotic resistance for a high percentage of the staphylococci involved. The organisms are undoubtedly a strain of the Staphylococcus genus indigenous to the hospital, which contaminate the skin, nasal passages, and gastrointestinal tract of patients during the course of their hospitalization. The control of antibiotic-resistant staphylococci looms as one of the most pressing problems with regard to safe performance of surgical procedures. This problem can be controlled in a large city hospital engaged in teaching medical students, interns, and residents if suitable techniques of asepsis and antisepsis are instituted. Constant vigilance on the part of the entire hospital staff is mandatory if improvements are to continue.

NEUROLOGY & PSYCHIATRY

Abnormalities in Central Regulation of Respiration in Acute and Convalescent Poliomyelitis. F. Plum and A. G. Swanson. A. M. A. Arch. Neurol & Psychiat. 80:267-285 (Sept.) 1958 [Chicago].

The authors performed clinical, physiological, and pathological studies on the nature of central respiratory failure in patients with anterior poliomyelitis who were admitted in the acute stage of the disease to the King County Hospital in Seattle and the Providence Hospital in Anchorage, Alaska, or were convalescing from poliomyelitis at the Northwest Respiratory and Rehabilitation Center. Central respiratory disturbances were noted in 7 female and 13 male patients, between the ages of 5 and 36 years, during the acute illness, and in 2 patients during late convalescence. The pattern of development and progression of centrogenic respiratory decompensation in acute poliomyelitis was similar in most of the 20 patients and could be divided into 3 stages. In stage 1 respiratory irregularity appeared only during sleep and was unnoticed by the patient. Stage 2 was marked by more serious physiological defects in respiration, and dysrhythmic breathing persisted during waking hours. Effort or concentration was required to maintain compensation for oxygen and carbon dioxide. Impaired chemosensitivity to carbon dioxide was indicated by depression of ventilation while the patient was breathing oxygen. Stage 3 was that of respiratory decompensation; hypoxia or hypercapnia rapidly appeared unless artificial respiration was started. Of the 20 patients, the centrogenic respiratory abnormalities did not progress further during the illness than stage 1 in 7 patients; they progressed to stage 2 in 5 patients and to stage 3 in the remaining 8.

No specific treatment was required for the breathing defect in stage 1. Artificial respiration by tank respirator was required sooner or later to treat all 13 patients in stage 2 or stage 3. It was learned that depressant drugs accelerate markedly the deterioration of central respiratory control in acute poliomyelitis; their administration must, therefore, be avoided in acutely ill patients, and oxygen therapy could be used safely only in conjunction with artificial respiration. When general anesthesia was employed for tracheotomy, it proved necessary to follow it with artificial respiration. Three of the 20 patients died of fulminating disease of the brain stem and central respiratory failure. Autopsy was performed on one of the 3 patients, and tissue blocks from the brain of another patient with central respiratory failure were obtained for examination. In both patients marked inflammatory changes and neuronal alterations were observed in the medullary reticular formation, and small necrotic foci in the ventrolateral reticular formation.

Irregular respiration during sleep persisted in 2 patients for many months after the acute poliomyelitis. These same patients also showed carbon dioxide retention without dyspnea, an impaired ventilatory response to increased tensions of inspired carbon dioxide, and reduction in ventilation while breathing 100% oxygen. These physiological abnormalities were attributed to permanent abnormalities in the functioning of the medullary respiratory center. Seven of 9 patients convalescing from spinal paralysis and having values of maximal breathing capacity and vital capacity of less than 50% of the predicted normal also showed subnormal responsiveness to carbon dioxide as a respiratory stimulus. It appears that in poliomyelitis, as in pulmonary emphysema, peripheral mechanisms restricting chest motion may contribute to an impaired ventilatory response to carbon dioxide. The clinical and physiological findings in the patients with central respiratory failure associated with poliomyelitis support the concept that an intrinsic and sensitive function of the medullary respiratory center is to establish the rhythmicity of breathing.

Implications of a Five-Year Study of 700 Basal Ganglia Operations. I. S. Cooper and G. J. Bravo. Neurology 8:701-707 (Sept.) 1958 [Minneapolis].

The authors present a summary of an intensive study of the effects of 700 globus pallidus and thalamic lesions in persons afflicted with Parkinsonism and diverse involuntary movement disorders. Follow-up of 55 patients who were subjected to elective anterior choroidal artery occlusion has demonstrated that this operation provided the most complete and lasting relief of far-advanced incapacitating rigidity, tremor, and deformity heretofore reported anywhere in the literature. Many of the patients have become ambulatory and independent in their daily life. The following conclusions can be documented as a result of follow-up studies of these 55 cases: 1. The effectiveness of anterior choroidal artery occlusion is due to infarction of more than a single anatomic structure. 2. Total relief of tremor, rigidity, incapacitation, and deformity is possible without inflicting any neurological deficit upon the patient. 3. Objective evidence of 5-year cure of the Parkinsonism symptoms of tremor, rigidity, and deformity has been achieved by anterior choroidal artery occlusion. 4. The dystonic deformities seen in some Parkinsonian patients are not actually fixed deformities but represent forced postures which are reversible even after many years' standing. 5. The so-called anterior choroidal artery syndrome is not invariable, and in many instances this vessel may be completely occluded without producing neurological deficit. 6. The ability of this procedure to relieve tremor and rigidity without inflicting neurological deficit warrants further consideration of other techniques which might be more universally applicable to a broader segment of the Parkinsonian population.

The techniques of chemopallidectomy and chemothalamectomy combine roentgen-anatomic methods of lesion placement deep in the brain. The production of a large lesion in the globus pallidus proved to be a relatively simple procedure with a small mortality and morbidity rate, favorable results having been obtained in 70% of the cases. Although rigidity could be relieved in 80% of such cases, tremor was alleviated in only 60%; however, when tremor was the presenting symptom, a lesion placed in the region of the ventrolateral nucleus of the thalamus provided complete relief of tremor in 90% of the patients. Tremor, rigidity, incapacitation, and deformity of Parkinsonism can be relieved by properly placed lesions in the globus pallidus or the thalamus or both without inflicting any motor, sensory, or intellectual deficit upon the patient. The extent to which such lesions can be inflicted on both sides of the brain is deserving of further elucidation.

A New Adjunct to the Treatment of Alcoholism: The Hallucinogenic Drugs. C. M. Smith. Quart. J. Stud. Alcohol 19:406-417 (Sept.) 1958 [New Haven, Conn.].

This paper describes a preliminary attempt to evaluate 2 hallucinogens in the treatment of a group of 24 particularly refractory alcoholics. LSD-25 (*d*-lysergic acid diethylamide) and mescaline were used as adjuncts to treatment, consisting of superficial psychotherapy supplemented by occupational and recreational therapy. The hallucinogens often produce, in addition to perceptual disturbances, a particularly vivid and intense awareness of personality problems. It was felt that these experiences might be utilized as part of a therapeutic program. The experience of "hitting bottom" has been much discussed in the Alcoholics Anonymous (A. A.) literature. It is at this time that the alcoholic addict is often susceptible to therapy. It was thought that these drugs might make the patient "hit bottom" artificially and thereby render him more amenable to psychotherapy. An attempt was made to enter into a psychotherapeutic relationship with the patient and to delineate the main problems. This phase lasted 2 to 4 weeks. The building up of adequate rapport was of critical importance, and on it largely depended the success or failure of the next phase. The patients were next given a single dose of LSD-25 or mescaline orally while in hospital. It was noted that alcoholics tend to be resistant to these drugs, and doses of 200 to 400 mcg. of LSD or 0.5 Gm. of mescaline were used. In addition to discussing with the patient problems leading to and arising out of his drinking, suggestions were made to the effect that he discontinue the use of alcohol, but no attempt was made to arouse fear. Discussions were resumed during the next few days, and the patient was discharged.

In some cases, follow-up psychotherapy was possible; in most, however, further contact was made through A. A. The follow-up period ranged from 2 months to 3 years. The average duration of the follow-up was one year. Many patients noticed a transient nausea half-hour to 2 hours after taking either drug. Three patients vomited, though not severely. The psychological effects varied greatly and persisted for an average of 8 or 9 hours. All patients felt well by the following day. Some of the patients showed mild abnormalities of the liver function tests. Yet these patients did not show an enhanced reaction to the drugs. Improvement was obtained in 12 of the 24 patients. In view of the refractory nature of the group, the results appear sufficiently encouraging to merit more extensive and controlled trials.

Toxic Effects of Disulfiram Therapy with Two Case Reports. N. H. Rathod. Quart. J. Stud. Alcohol 19: 418-427 (Sept.) 1958 [New Haven, Conn.].

The mode of action of disulfiram, which has been used in the treatment of alcoholism since 1948, is not completely understood, but it is postulated that many of the effects produced by the combination of disulfiram and alcohol in the body result from disulfiram interfering with the metabolism of acetaldehyde. Its administration is thought to be contraindicated in hypertension, pregnancy, diabetes mellitus, and diseases of the liver, kidneys, and thyroid. Side-effects associated with disulfiram therapy include fatigue, sleepiness, headache, dizziness, reduced vitality, and reduced potency. Toxic phenomena attributed to the drug have included initial tiredness, with subsequent disorientation, disinterestedness, loss of memory for recent events, anxiety, depression, paranoid equivalents, and restlessness. It is not clear, however, whether the toxic reactions are due to disulfiram entirely.

The histories of 2 patients are presented, in each of whom toxic symptoms developed on 2 separate occasions while they were receiving disulfiram, and on each occasion these symptoms subsided when a placebo was substituted. At no time did the patients know what type of medication they were receiving. Similar toxic symptoms developed in both patients in spite of marked differences in physical state, personality, and duration of treatment. Neither of the patients had a family history of psychiatric illness, and even though both had suffered from adverse effects of alcohol, the symptoms noted under disulfiram therapy showed little resemblance to those due to alcohol in the past. The second patient showed marked abnormality of the electroencephalogram while suffering from the effects of disulfiram, but this more or less cleared on clinical recovery.

The toxic phenomena noted in these patients were similar to those mentioned above. They seemed exogenous in origin and of a toxic-confusional nature with depressive features. Depersonalization phenomena, paranoid ideas, and perseveration were noted in individual episodes. The onset of the symptoms was insidious with a tendency to sudden exacerbation. The last symptoms to clear up were the memory disturbances and disorientation. A significant point is that both patients had had delirium tremens in the past. This raises the question of whether persons who had not suffered from any functional and structural disorder of the brain would develop such symptoms when given disulfiram. This question cannot be answered.

GYNECOLOGY & OBSTETRICS

Some Observations on the Incidence of Pre-Eclampsia. I. MacGillivray. J. Obst. & Gynaec. Brit. Emp. 65:536-539 (Aug.) 1958 [London].

Preeclampsia is difficult to define. The patient's prepregnancy blood pressure should be known, or at least the pressure in the first trimester, that is, before preeclampsia has begun to affect it. This report is concerned with a study of the incidence of preeclampsia in booked primigravidas in the Aberdeen Maternity Hospital during the years from 1948 to 1955. Since more than 90% of all Aberdeen primigravidas are confined in hospital, the group under review is fairly representative of all such patients in the city. A retrospective study of case records was used to study the influence of certain factors on the incidence of preeclampsia, with the following conclusions: 1. The condition is typically a disease of the primigravida, severe preeclampsia being about 15 times greater in a first than in a second pregnancy. 2. When the first pregnancy ends in abortion, the incidence of severe preeclampsia in the next pregnancy is only 2% compared with 6% in a primigravida. 3. Twin pregnancy increases the incidence in a primigravida by 5 times, and it is still high in a second pregnancy. 4. Threatened abortion does not predispose to preeclampsia. 5. Stature and social class do not influence the incidence. 6. The incidence of mild preeclampsia seems to be increased in primigravidas over 30 years of age.

Treatment of Eclampsia: First Use of a Steroid Anesthetic, the 21-Hydroxypregnanedione Sodium Succinate: A Preliminary Note. G. Martini, A. Pesce and G. Rugiero. Minerva ginec. 10:511-514 (July 15) 1958 (In Italian) [Turin, Italy].

Viadril (21-hydroxypregnanedione sodium succinate) produced complete remission of convulsions in 5 patients with eclampsia, 2 of whom had previously been unsuccessfully treated with other anticonvulsive drugs. A total dosage of from 4,000 to 5,000 mg. of Viadril was divided into several doses administered intravenously every 2 or 3 hours. The initial dose of 500 mg., dissolved in 20 cc. of distilled water, was followed by doses of from 500 to 1,000 mg. each. A hypnoanalgesic state, which developed 10 minutes after the first administration of the drug and lasted 30 to 60 minutes, was followed by drowsiness of an hour or two duration. The patients reacted to stimulus, though, and moved in bed, and some of them could talk. This state of semiconsciousness was an intermediate one between physiological sleep and loss of sensation in anesthesia. Induction of this state reduced the cortical excitation; it produced a certain degree of hypnosis, amnesia, analgesia, and, to a smaller extent, hypotension. No toxic effects were observed either in the mothers or in the fetuses, and there was no evidence of cerebral damage caused by anoxia. Renal disorders associated with eclampsia changed insignificantly. Blood pressure decreased by 20 to 40 mm. Hg for a few hours; it returned to the initial level, however, unless the administration of the drug was repeated. The state of confusion disappeared when the patients were kept for a sufficient length of time in semihypnosis. It seems that Viadril reduced the state of high cortical and neurovegetative excitability as the cause of tonicoclonic convulsions. Therapy with detoxicating agents was instituted after remission of eclampsia.

Cesarean Section for Cephalopelvic Disproportion After Previous Vaginal Deliveries. J. B. Davila and G. Rivera-Ayala. Bol. Asoc. méd. Puerto Rico 50: 243-248 (July) 1958 (In English) [Santurce].

Twenty-one thousand one hundred forty pregnant women were delivered in the department of obstetrics of the San Juan City Hospital between 1952 and 1957. Two hundred twenty-two women were delivered by cesarean section because of the presence of cephalopelvic disproportion. This group included 199 primiparas and 23 multiparas who had previously had 3 or more vaginal deliveries. Of the babies of the 23 multiparas who were delivered by cesarean section, 19 were larger and weighed more than the largest baby previously delivered vaginally by the same mother; four babies were smaller and weighed less. The total length of labor in the preceding vaginal deliveries ranged from 2 to 27 hours, whereas the length of labor prior to cesarean section was between 1½ and 36 hours. Of the 23 babies of mothers delivered vaginally, 18 were in good condition at birth, 2 were born in poor condition and died on the second day, and 3 were stillborn. Of the 23 babies of the same mothers delivered by cesarean section, 22 were in good condition at birth, and 1 was stillborn. The possibility of vaginal delivery does not depend only on the relationship of the head of the baby and the pelvis of the mother. In a woman who has delivered vaginally, subsequent pregnancies will not always end with a vaginal delivery.

In one with a borderline pelvis, if the difference in weight of the 2 babies is only a few ounces, the previous heavier baby may have been born vaginally in very poor condition, or dead, after a difficult labor. Also, presentation and position of the babies may be different, that is, occiput posterior or breech, and weight of the previous baby may have been incorrect.

In determining the method of delivery (vaginal or cesarean section) to be used in a given case, in either a primipara or a multipara, the authors suggest the following scheme: (1) prenatal evaluation of the pelvis by vaginal examination and (2) evaluation of the pelvis if the patient has been in labor for 12 hours and has not delivered. For a multipara only they suggest: (1) evaluation of the pelvis as a routine when the woman is admitted to the labor room with a floating vertex or a malpresentation; (2) evaluation of the pelvis when the patient develops secondary inertia during labor; and (3) evaluation of the pelvis when she has been in labor for 15 or 30 minutes after full dilatation and has not delivered. X-ray pelvimetry is of value in evaluating the pelvis of a multipara with a floating vertex or a malpresentation.

Examinations of the Menstrual Blood for Tubercle Bacilli in a Sanatorium for Pulmonary Tuberculosis. G. Pickroth. Tuberkulosearzt 12:569-572 (Sept.) 1958 (In German) [Stuttgart, Germany].

The diagnosis of tuberculosis of the internal female sex organs by examination of the menstrual blood has been improved considerably with the use of Niedner's hematophor. This is an instrument made of fireproof glass which is easily inserted into the vagina. The blood is collected directly from the opening of the cervix and will not be mixed with any discharge of the vagina. Of 101 women with pulmonary tuberculosis who were admitted to a sanatorium in Jena, Germany, only 5 had known tuberculosis of the internal sex organs. Examination for the detection of tubercle bacilli in the internal sex organs was performed with the use of the hematophor in 56 of the 101 patients (including the 5 mentioned above), while in the remaining 45 patients this type of examination was not performed for various reasons. With the exclusion of the 5 patients with known tuberculosis, the presence of Mycobacterium tuberculosis in the menstrual blood was detected by culture in 10 of the remaining 51 patients. The gynecologic findings were negative in 7 patients and insignificant in 3. Patients were given chemotherapy only after withdrawal of the menstrual blood, in order not to interfere with the detection of tuberculosis, and in this way the rate of positive findings in the menstrual blood increased from 16 to 20%. Since the tubercle bacilli in the internal sex organs may possibly spread to other organs in the patient's body, routine examination of the menstrual blood with the hematophor should be performed in sanatoriums for patients with pulmonary tuberculosis as an important aid in early diagnosis of tuberculosis of the internal sex organs

Possibility of Using a New Orally Administered Diuretic "Acetazolamide" in Edema of Pregnancy C. Morra. Minerva ginec. 10:514-523 (July 15) 195 (In Italian) [Turin, Italy].

The author investigated the diuretic action o acetazolamide in women with normal pregnancy and in pregnant women with edema of pregnancy in order to evaluate its application in those in whom edema of pregnancy is the only symptom o in whom edema is associated with other disorder of pregnancy (albuminuria and hypertension). Acetazolamide was given orally to 16 hospitalized primigravidas, divided into 3 groups. One group consisted of 6 women with normal pregnancy; th second group consisted of 6 pregnant women with edema of pregnancy; the third group consisted o 4 pregnant women, in whom edema of pregnancy was associated with albuminuria and hypertension A total dosage of 1,500 mg. of acetazolamide, divided into 4 equal doses, was administered orally to the patients for 4 consecutive days. Urine and blood samples were taken the day before and 40 hours after the beginning of the drug therapy. Women of the first group were kept on a standard diet for pregnant women, whereas the others were kept on a diet low in sodium. Diuresis increased only slightly and for a short period of time in women with normal pregnancy. The excretion of potassium, and to a higher degree of sodium, was proportionally higher than the elimination of water; on the 4th day of treatment the excretion was only slightly higher than before the onset of the drug therapy. It thus became obvious that the body tended to spare and to accumulate water. The body weight of the patients fell insignificantly during this period.

Increase of diuresis was considerable and was prolonged in time in women with edema of pregnancy (groups 2 and 3). Elimination of water and of salts was proportional to their absorption by the organism before the drug therapy. Diuresis reached the highest level on the first day of administration of acetazolamide to women with edema of pregnancy, and it remained at high level for several days. On the 4th day of therapy diuresis decreased slightly and would have continued for several days after the withdrawal of acetazolamide if complete relief of edema had not been obtained during the therapy. The elimination of sodium in patients with edema alone or edema associated with other symptoms (groups 2 and 3) was, in terms of percentage, higher than the elimination of water, and it reached its highest level on the second day of drug therapy. Blood acidosis started to rise gradually from the 1st to the 4th day of treatment with acetozalamide, but it never reached an alarming level. Patients with edema of pregnancy lost 2 to 5 kg. (5 to 11 lb.) in weight after 5 days of therapy. The most advantageous features of acetazolamide therapy in patients with edema of pregnancy appeared to be a prompt, efficacious, and profuse elimination of both water and sodium and the absence of toxic effects on the renal tubules.

An Evaluation of Chlorothiazide in the Treatment of Edema in Pregnant Women. L. C. Chesley and L. Uichanco. Am. J. Obst. & Gynec. 76:467-472 (Sept.) 1958 [St. Louis].

A new diuretic sulfonamide, chlorothiazide (6-chloro-7-sulfamyl-1,2,4 benzothiadiazine-1,1-dioxide), was given to 7 hospitalized pregnant women with edema. The patients treated had been in bed most of the time and on a low-sodium diet for at least 4 days before administration of the drug was started. They were then given 1 Gm. of chlorothiazide per day in 2 divided doses, one in the morning and the other in the early evening, for 6 consecutive days. Chlorothiazide increased the sodium excretion in 6 of the 7 patients studied, although drug resistance developed progressively within a few days. When treatment with the drug was restarted after a 3-day rest, natruresis again occurred in 3 patients. All 7 patients had already lost weight on treatment by bed rest and dietary sodium restriction alone, which had preceded the treatment with chlorothiazide. The good diuretic effect of this previous treatment was also shown by the negative sodium balance still present in the patients when the administration of chlorothiazide was started. These observations suggest that chlorothiazide stimulates sodium and chloride excretion in pregnant edematous women after the major diuretic effect has been achieved by bed rest and low-sodium diet.

PEDIATRICS

Antibacterial Activity of Serum After Oral Doses of Triacetyloleandomycin, Erythromycin, Potassium Penicillin V and Penicillin V. C. M. Kunin, C. V. Pryles and M. Finland. Pediatrics 22:422-431 (Sept.) 1958 [Springfield, Ill.].

Eight normal young men, ranging in body weight from 70 kg. (154 lb.) to 105 kg. (232 lb.), were given in a double, Latin-square rotation an oral dose of 500 mg. of 4 preparations, i. e., pressed tablets of penicillin V, similar tablets of potassium penicillin V, coated tablets of erythromycin, and capsules of triacetyloleandomycin. These were taken 3 or 4 days apart, each with a glass of water a half-hour to one hour before breakfast, and serum was obtained from each patient before and 1, 2, 5, and 8 hours after each dose. All serums collected on each day were assayed simultaneously for activity against Streptococcus 98, Staphylococcus 209 P, and a penicillin-resistant strain, Staphylococcus 400. In a second study, 30 children, between the ages of 2½ and 13 years, ranging in body weight from 11 kg. (25 lb.) to 20 kg. (44 lb.), were divided into 3 comparable groups of 10. The first group was given a suspension of crystalline erythromycin ethyl carbonate, the second received a suspension of triacetyloleandomycin, and a suspension of penicillin V was administered to the third. Doses of 25 mg. per kilogram of body weight were given every 8 hours, and serums for assays were obtained from all 30 children before and 2 and 8 hours after the first dose, and from some on the morning of the 4th day. These serums were all tested for antibacterial action against Streptococcus 98 and Staphylococcus 209 P.

Triacetyloleandomycin produced antistreptococcic and antistaphylococcic activity in the serums of the normal men and of the children comparable to that produced by equivalent amounts of the erythromycin preparations used. The better and more rapid absorption of doses of potassium penicillin V given orally, as compared with acid penicillin V, was confirmed. It was also shown that penicillin V, either as the acid or as the potassium salt, produced significantly higher peak levels of antibacterial activity than either erythromycin or triacetyloleandomycin.

Avitaminosis E in Cystic Fibrosis of the Pancreas: A Morphologic Study of Gastrointestinal and Striated Muscle. W. A. Blanc, J. D. Reid and D. H. Andersen. Pediàtrics 22:494-506 (Sept.) 1958 [Springfield, Ill.].

The authors examined for the presence of ceroid pigment the routine hematoxylin-and-eosin-stained sections of the gastrointestinal tract of 151 children with cystic fibrosis of the pancreas, who had died and on whom autopsies were performed. For control purposes, a similar survey was made of 50 appendixes removed from otherwise normal children, who were above 10 years of age, and of autopsy material obtained from 392 children without pancreatic deficiency, cirrhosis of the liver, or biliary atresia. Fragments of striated muscle obtained from 68 of the 151 children with cystic fibrosis of the pancreas were studied likewise. A diffuse deposition of ceroid pigment was found consistently in the smooth-muscle layers of the gastrointestinal tract of children with cystic fibrosis of the pancreas. The deposition was first seen in children in the 2nd year of life and was frequently extensive in those in the 4th year. It was found in all patients 5 years of age and older, and the amount of ceroid pigment had increased. It has not been observed in other pediatric conditions, with the exception of biliary atresia and cirrhosis of the liver. Extensive deposit of ceroid pigment probably represents an expression of prolonged and severe vitamin E deficiency, related to protracted malabsorption of fat-soluble tocopherols.

Only rare instances of changes in the striated muscles were observed in the children with cystic fibrosis of the pancreas. These changes were inconstant and did not appear to be part of a generalized process. They did not bear any relation to the age of the patient, the severity of the disease, and the amount of ceroid pigment deposited in the smooth muscles.

Cloaca with Non-adrenal Female Pseudohermaphrodism. W. K. Sieber and R. Klein. Pediatrics 22: 472-477 (Sept.) 1958 [Springfield, Ill.].

The authors report on 2 infants who had previously unreported urogenital anomalies. Both patients were females with pseudohermaphroditism of nonadrenal origin who had persistent cloacae. This rare combination of anomalies was recognizable clinically. The causation of the anomalies is unknown. If the diagnosis is made promptly, surgical correction may possibly prevent serious renal damage. It would seem that the surgical approach to this anomaly would be a vaginal-type, pull-through operation in which the vagina would be transposed anteriorly behind the clitoris. This procedure was contemplated in the second infant and was actually performed on the first. The obstruction of the upper portion of the urinary tract was a constant problem in both patients and may have been an indirect cause of death in the second patient. The first patient has urinary incontinence and reduced renal function but is alive at 6 years of age.

DERMATOLOGY

Acute Peptic Ulcer After Triamcinolone Therapy: Report of Three Cases. C. H. Brown and J. R. Haserick. A. M. A. Arch. Dermat. 78:289-292 (Sept.) 1958 [Chicago].

The role of steroids in the pathogenesis of peptic ulcer is not clear. In a small percentage of patients the development of peptic ulcers, both gastric and duodenal, has been an unfortunate sequela of steroid therapy. No matter which cortisone or cortisone-like drug is used, the incidence of ulcer does not seem to vary. In general, peptic ulcer develops more frequently in patients who have been given large doses of steroids for relatively long periods of time. It has been the authors' experience that the majority of patients in whom "steroid ulcers" develop have previously had peptic ulcers or have some other contributing condition, such as duodenal stasis associated with mesenteric root compression. The authors, and also other workers, have been able to give steroids safely to patients who have previously had peptic ulcers by combining simple ulcer treatment with steroid therapy, and patients so treated have had no recurrence of the ulcers. Various workers have reported a low incidence of peptic ulcers in patients receiving triamcinolone (Aristocort).

The occurrence of an acute duodenal ulcer in one patient within a short time after the start of treatment with small doses of triamcinolone and the development in 2 other patients of ulcer associated with triamcinolone therapy seem to be of interest. The first patient, a 41-year-old man, had had psoriasis for 12 years. He had no gastrointestinal symptoms when first admitted to the Cleveland Clinic Hospital, nor did his history reveal any ulcer or digestive disease. Typhoid vaccine was administered intravenously, and he was instructed to follow the Goeckerman regimen. Improvement in his psoriatic condition resulted from this treatment, and he was discharged from the hospital Four and one half years later in acute flare-up of the psoriasis led to the use of triamcinolone in treating this patient. Twenty-one days later he passed 2 tarry stools and complained of having had intermittent, recurrent epigastric pain for several days. He was then readmitted to the hospital for diagnosis and treatment. Palpation of the abdomen disclosed localized tenderness that was restricted to a small area in the epigastrium and the right upper quadrant. No masses were palpated, and there was no muscle spasm. The other physical findings, including those of the heart, lungs, and rectum, were normal. Roentgenograms after barium swallow showed the esophagus and the stomach to be normal. There was a slight deformity of the duodenal bulb, and a large ulcer crater was visible on the posterior wall of the bulb. The epigastric pain disappeared within 24 hours after ulcer therapy was instituted, although the patient surreptitiously continued to take 8 mg. of triamcinolone daily for one week. The rapidity with which ulcer developed with small doses of this drug suggest that in this patient the steroid may have been ulcerogenic. Symptoms of ulcer did not appear in the other 2 patients until 6 weeks after the start of triamcinolone treatment.

This experience suggests that the same precautions against ulcer should be taken with triamcinolone as with other steroids. Any patient who has had an ulcer should follow at least a simple ulcer program while under treatment with steroids. Many patients with steroid ulcers do not present the classic symptoms of peptic ulcer but rather those of the complications of ulcer, such as massive bleeding or perforation or both. The possibility that a peptic ulcer that is symptomatically atypical may occur in patients treated with steroids should be kept in mind.

Oral Treatment of Keloids. E. W. Kelly Jr. and H. Pinkus. A. M. A. Arch. Dermat. 78:348-352 (Sept.) 1958 [Chicago].

A form of systemic therapy for keloids, which would be free from the drawbacks of the corticosteroids and which would make it possible to avoid the disagreeable features and shortcomings of local injections, surgery, or irradiation, would be highly desirable. Experience with tetrahydroxyquinone (THQ) in 45 consecutive patients has shown that this drug may cause some regression in keloids of as much as 40 years' duration and may produce complete resolution in some younger lesions. It relieves the pain and pruritus often associated with keloids promptly, but the objective regression of the lesion is slow. No side-effects or untoward reactions have been observed, and the drug has been proved nontoxic in animal experiments in which enormous doses were used. The only undesirable reaction encountered has been the occasional local breakdown of keloid tissue accompanied by the discharge of necrotic material. This apparently results from the softening of the tissue around old devitalized collagen bundles and is actually a sign of effectiveness of the treatment. The action of THQ is selective. Biopsy specimens from the normal skin of persons under treatment with THQ showed none of the changes seen in the treated keloid. The question, therefore, arises: What is it in the keloid that is controlled by this redox-active drug? Alteration of redox potentials in the tissue is a possibility. Action on enzyme systems seems another. The enzymes of the dermis have not been studied to any great extent by histochemical means. In a few preliminary studies, the authors observed esterase-positive granules in mast cells. Investigation of the changes that may occur in the dermal enzymes during treatment with THQ would apparently be worthwhile and might help to explain its favorable effect on keloids.

Cutaneous Reactions Due to Sulfamethoxypyridazine. D. G. Lindsay, I. Prlina, A. J. Bischoff and S. W. Becker Sr. A. M. A. Arch. Dermat. 78:299-303 (Sept.) 1958 [Chicago].

Cutaneous reactions, ranging from mild eruptions to severe generalized dermatitis, appeared in 6 of 55 hospitalized patients and in 7 of 30 ambulatory patients, all of whom were being given sulfamethoxypyridazine (SMPZ). This drug, which has been found effective in patients with urinary tract infection, is readily absorbed from the gastrointestinal tract and is slowly excreted in the urine. Its antibacterial effectiveness is comparable to that of sulfadiazine. The occurrence of erythematous maculopapular dermatitis after its administration, therefore, seems to be of interest. The previous administration of sulfonamides apparently does not influence the incidence of reactions, but it does seem to determine the time of their onset. In general, if a reaction is going to occur, it will appear within 1 to 5 days in patients who have previously received sulfonamides, whereas in those not previously given sulfonamides the reaction often appears on about the 14th day. In 5 of the 13 patients with toxic reactions to SMPZ, the dermatitis appeared in about 2 weeks. Four of these patients, all of whom had received 1 Gm. or more of the drug daily, gave no history of previous treatment with sulfonamides. In 6 other patients, 4 of whom had previously taken sulfonamides, the reactions developed in less than 7 days. Dermatitis appeared in the remaining 2 patients, neither of whom had previously been given sulfonamides, 9 days and 42 days, respectively, after they began to take 1 Gm. of SMPZ daily. The occurrence of untoward reactions is apparently related to the amount of the dose in some patients, but not in all. Thus, only 2 of the 30 patients receiving 0.5 Gm. daily showed an untoward reaction, as compared with 11 of the 55 patients receiving 1 Gm. or more a day.

Daily serum SMPZ determinations did not show a gradual increase with time at a constant dosage but averaged about 10 mg. per 100 cc. in patients taking 1 Gm. daily and about 5 mg. per 100 cc. in those taking 0.5 Gm. daily. There were wide variations from these mean values, however; no correlation could be made between the occurrence of reactions and the serum SMPZ levels because of an insufficient number of determinations. To prevent severe reactions, sulfonamide therapy should be stopped at the first sign of trouble. Most of the reactions in these patients were mild, but in 1 of the 2 patients who received the largest total dosage the dermatitis became so severe and extensive that he appeared moribund 6 days after its onset. Vigorous treatment with corticosteroids (hydrocortisone, corticotropin, and prednisolone) and antibiotics (penicillin and streptomycin) eventually overcame the reaction, and by the time the patient was discharged from the hospital, 6 weeks after the dermatitis appeared, all the skin lesions had healed.

Changes in the Skin as a Result of Electric Current. L. H. Winer and G. H. Levin. A. M. A. Arch. Dermat. 78:386-390 (Sept.) 1958 [Chicago].

Clinically, electric burns can vary in degree from a superficial erosion to a charred, bullet-hole-like wound. The histopathological changes in the epidermis are striking. Noteworthy are (1) the production of bundles of vacuolated spindle-shaped cells, (2) the separation of epidermis from cutis, (3) coagulation of collagen of the cutis, (4) cavity formation in the cutis and deposition of nests of epidermal cells, and (5) retention of hair follicles. The absence of cellular inflammatory reaction is remarkable. These changes were evident in a specimen removed from a 20-year-old youth who died after accidental electrocution by 5,000 volts of high-tension electric current. The skin lesion was 3 in. in diameter on the forearm and was charred. The specimen removed for microscopic examination was sectioned and stained with hematoxylin and eosin. It was denuded of epidermis. The connective tissue fibers in the cutis were fused together in a solid mass which stained dark red. The blood vessels within this mass were thrombosed, and in some areas free hemorrhage occurred into large cavities of the dermis. Elastic resorcin staining revealed an intense increase in elastic-like fibrils which were definitely fragmented. On Mallory staining, the degenerated collagen, in its more superficial areas, was dark red; deeper in its midportion it was violet; and in its depths, just above the fatty tissue, it stained its normal blue color. The replacement of the normally blue-staining collagen with red-staining fibers supports the assumption that the electric current produced a large mass of elastic fibers. This increase in elastic fibers, together with degeneration of the collagen, is noteworthy because it is not seen in pure thermal burns. Moreover, the elastic fiber increase probably accounts for the soft, noncontractible scar with which electric burns heal.

OPHTHALMOLOGY

A Report on the Attempted Isolation of the Virus of Trachoma. C. H. Smith, M. J. Gilkes and J. Sowa. Brit. J. Ophth. 42:461-472 (Aug.) 1958 [London].

The authors report on various attempts made to isolate the virus of trachoma in Jordan and Gambia, where the disease is endemic and a large proportion of the population is infected, and in London, where occasional cases were observed in the outpatient departments of Moorfields Hospital in patients who had been infected before arriving in England. Specimens for isolation of the virus were taken from the conjunctiva of the infected persons by means of a spatula made from aluminum wire. *It proved impossible to isolate trachoma virus in* HeLa cells, conjunctival cells, mice, or chick embryos. Although there was some delay between the taking of scrapings and the inoculation into animals or tissue cultures, it seems unlikely that time alone was sufficient to inactivate the inoculums. It is possible that the virus was not cytopathogenic or inclusion-producing in tissue culture or that it was incapable of entry into the cells of the culture. It may also be possible that the inclusions found in superficial cells represented an "incomplete" viral form, the limited metabolism of these superficial cells preventing complete development of the virus. The administration of antibiotics to the patients from whom the specimens for isolation of the virus were obtained might have increased the difficulties of isolation of the virus in tissue cultures. Viruses do not always multiply in the tissue apparently most closely resembling that from which they are isolated; thus, cytomegalic inclusion virus grows in fibroblasts, and certain enteric cytopathogenic human orphan (ECHO) viruses from human sources will not multiply in human cells. Hence, it may be necessary to obtain completely fresh cell lines, and this would seem to be one of the most fruitful approaches to the problem of isolating the trachoma virus.

Retrolental Fibroplasia in Association with Mental Defect. C. E. Williams. Brit. J. Ophth. 42:549-557 (Sept.) 1958 [London].

Retrolental fibroplasia is a major cause of blindness in premature children. The incidence of mental defect in premature children has been variously estimated as between 4 and 10%. The incidence of severe mental defect in children with retrolental fibroplasia has varied from 10 to 40% in different investigations. The author was able to review the admissions to and the discharges from the Sunshine Homes over the past 10 years. These homes admit about one-third of the blind children in England and Wales for care and early training. At least 50% of the children discharged from the Sunshine Homes as "ineducable" between 1950 and 1956 suffered from retrolental fibroplasia. The author found that, of a total of 24 children with retrolental fibroplasia, 23 had been born prematurely. A history of being nursed in oxygen tents was available for 18 of them; for 4 there was no such history, but they were born at a time when it was routine to nurse premature infants in high concentrations of oxygen; and 1 child received oxygen by nasal catheter at meal times. The one child with retrolental fibroplasia who had not been born prematurely had not received oxygen; in this child the etiology remained unexplained. The degree of mental defect was not related to the duration of oxygen therapy. There were no cases of cerebral palsy in the series, but 2 children had congenital heart lesions and in 6 children there was a history of antepartum hemorrhage during the mother's pregnancy. The incidence of mental defect in cases of retrolental fibroplasia appears to be greater than could be explained by the factor of prematurity.

THERAPEUTICS

Chloropropamide: A New Hypoglycaemic Agent. I. Murray, M. J. Riddell and I. Wang. Lancet 2:553-554 (Sept. 13) 1958 [London].

The results obtained by giving chlorpropamide [N-propyl-N-(*p*-chlorobenzene sulfonyl) urea], a new preparation, to 43 patients showed it to be an effective oral hypoglycemic agent in the treatment of diabetes. Its action, however, like that of similar drugs, is somewhat unpredictable. The patients selected for this trial were essentially of the type considered most suitable for oral therapy, i. e., they had had diabetes for less than 10 years, were over 40 years old, and had taken insulin, if at all, for not more than 2 years. Only 2 patients were obese, although 17 others had been so. Diet alone had not controlled the diabetes sufficiently. The initial dose of chloropropamide as in the authors' original investigation of carbutamide, was 1 Gm. daily at breakfast, but no loading dose was given in the first 2 days of treatment. The response to this dose of 1 Gm. daily was satisfactory in 28 of the 43 patients treated. These 28 patients, who constituted the successes, were similar as a group to the remaining 15, who were the failures, except that ketonuria had previously been noted in 4 (27%) of the failures as compared with only 1 (4%) of the successes. In the successes, a satisfactory response was evident generally by the 2nd or the 3rd day and always within 7 days (mean, 3.2 days), all 3 of the daily urine tests being recorded as "blue" or, at worst, showing an occasional trace (0.25%). Some of the patients had previously received carbutamide or tolbutamide. Comparison of the results obtained by the use of these drugs with those obtained by the use of chlorpropamide produced the impression that chloropropamide is somewhat less potent than carbutamide, but definitely more potent than tolbutamide.

The dose of chlorpropamide was increased in 5 patients who did not respond well to 1 Gm., 4 receiving 2 Gm. daily and 1 receiving 3 Gm. The increased dosage resulted in satisfactory control in 3 of these patients, but since the possibility of side-effects makes the administration of more than 1 Gm. of chlorpropamide a day inadvisable, these cases were listed as failures. No serious toxic effects were noted, nor was there any evidence of either leukopenia or thrombocytopenia, but 7 patients suffered from nausea (insufficient to call for abandonment of treatment); 1 had a diffuse erythematous rash; and 1 showed drowsiness unaccompanied by hypoglycemia. The occurrence of these side-effects, which appeared in 4 cases after the dosage had been increased to 2 Gm., suggests that the dose should not exceed 1 Gm. daily and that smaller doses should be used when possible. Satisfactory results have already been obtained with 0.5 Gm., but further experience is required before the best dosage can be decided on. Provisionally, treatment may be begun with a single dose of 1 Gm. a day, to be reduced to the lowest level found effective as soon as a good result is obtained.

PATHOLOGY

Leukocyte Sedimentation Rate in Patients with Lymphosarcoma, Reticulosarcoma and Malignant Lymphogranuloma. L. Bellesia, E. Lusvarghi and C. Pasquinelli. Minerva med. 49:2856-2861 (July 21) 1958 (In Italian) [Turin, Italy].

The authors studied the leukocyte sedimentation rates, according to the technique devised by Storti, in 58 patients with either lymphosarcoma, reticulosarcoma, or Hodgkin's disease. The patients were divided into 2 groups; one group had previously been given chemical or roentgen-ray antineoplastic therapy, but the other had not. Of the 38 patients in the latter group, 12 had either lymphosarcoma or reticulosarcoma, and 26 had Hodgkin's disease. Hodgkin's disease was in remission in 13 patients and in the process of first manifestation or reactivation in the remaining 13. Of the 20 patients who were receiving chemical or roentgen-ray treatment at the time of this study, 10 had either lymphosarcoma or reticulosarcoma, and 10 had Hodgkin's disease. The leukocyte sedimentation rates were within normal values and the Katz formula levels were increased among the patients with lymphosarcoma or reticulosarcoma who had not previously received antineoplastic therapy. These values varied similarly among the patients with Hodgkin's disease, both the leukocyte sedimentation rates and the Katz formula levels being within normal limits when the disease was subsiding and being elevated when the disease was in progress or in process of reactivation. The leukocyte sedimentation rates, unlike the Katz formula levels, did not change in patients with either lymphosarcoma or reticulosarcoma who were receiving chemical or roentgen-ray antineoplastic treatment. At the end of treatment, though, the leukocyte sedimentation rates returned to within physiological limits at a rate similar to, or slightly faster than, the Katz formula levels in patients with Hodgkin's disease in progress or in process of reactivation.

The leukocyte sedimentation rate seems to have a diagnostic value in differentiating lymphosarcoma and reticulosarcoma from Hodgkin's disease. This is particularly true during the first manifestation of the disease and when a diagnostic biopsy yields little information. The error in establishing a correct differential diagnosis by the leukocyte sedimentation rate varied within a margin of 5%. The high leukocyte sedimentation rate in Hodgkin's disease during the first manifestation or reactivation of the disease and the presence of a normal level when the symptoms of the disease are in remission are reliable clinical aids for differentiating the reactivated from the dormant phase of the disease. The erythrocyte sedimentation rate also serves well as a test, although its level, unlike that of the leukocyte sedimentation rate, may be affected by the presence of anemia or of an imbalance in the serum protein level. The leukocyte sedimentation rate can be useful during chemical or roentgen-ray antineoplastic treatment of Hodgkin's disease. A high leukocyte sedimentation rate at the termination of a course of antineoplastic treatment would suggest continuation of the treatment. If the leukocyte sedimentation rate returns to normal limits in the course of antineoplastic treatment, it may be advantageous to withdraw the specific treatment, since it has reached the useful therapeutic dosage.

Hypertensive Vascular Disease as a Consequence of Increased Arterial Pressure: Quantitative Study in Rats with Hydralazine-Treated Renal Hypertension. G. M. C. Masson, L. J. McCormack, H. P. Dustan and A. C. Corcoran. Am. J. Path. 34:817-833 (Sept.) 1958 [Ann Arbor, Mich.].

The quantitative associations between levels of arterial blood pressure and the occurrence and character of hypertensive vascular lesions (myocardial, mesenteric, and pancreatic) were tested in rats subjected to partial renal infarction and unilateral nephrectomy. The levels of blood pressure were controlled by the administration of hydralazine in drinking water. This mode of administration of the drug was found to secure stable control of blood pressure at normal levels in most animals. In experiments of short duration (7 to 14 days), acute vascular lesions were found in the majority of animals with untreated hypertension. These were largely prevented by maintenance of blood pressure within a normal range and, when they had been allowed to develop, were found to lose their acute characteristics when remission of hypertension was induced by hydralazine. A similar sequence was established in experiments of longer duration (1 to 2 months). The latter experiments also showed that control of renal hypertension by a drug for one month did not prevent the onset of severe hypertension and vascular lesions when the drug was withdrawn. The data demonstrated a close association between blood pressure levels and the presence and character of the vascular lesions. The observations confirm the view that mesenteric "arteritis" of rats with hypertension is in fact an expression of hypertensive vascular disease.

The sensitivity of the renal vascular bed to hypertension was demonstrated in a group of hypertensive, hydralazine-treated rats which showed slight extrarenal vascular alterations but, in some cases, severe and apparently progressive lesions in renal vessels. In accordance with previous clinical observations, treatment of renal hypertension in rats did not restore heart size to normal. On the contrary, continuous treatment with hydralazine in doses sufficient to prevent the onset of hypertension was found to increase heart size, presumably as a result of increased heart rate and output.

RADIOL

Angiocardiographic Features Garland Syndrome. E. K. Lang, L. J. G. Mcafee. Am. J. Roentgenol. 80: 1958 [Springfield, Ill.].

Anomalous origin of the left coronary from the pulmonary artery (Bland-White-Ga syndrome) has been recognized clinically with creasing frequency in recent years. All 62 patients with this condition, whose cases were collected from the literature, died. Of the 62 patients, 50 were infants and 12 were adults. The anomaly involved the left coronary artery in 44 infants and both coronary arteries in 6 infants. In 9 adult patients the anomaly involved the left coronary artery, and in only 3 the right coronary artery. In the adult patients the anomalous origin of the coronary arteries either was an incidental postmortem finding or was observed at autopsy in those who died suddenly without preceding symptoms. Chest roentgenograms were obtained in 24 of the 44 infants and they showed marked cardiac enlargement with left ventricular preponderance.

The authors report on 4 infants with proved anomalous origin of the left coronary artery in whom a characteristic picture was found on angiocardiography. The angiocardiographic findings in these patients suggest that, with the intravenous injection of a radiopaque material, visualization of all the cardiac chambers is good despite the marked cardiac enlargement and slow circulation time, because of the absence of intracardiac shunts. The right chambers are usually normal in size, but the right ventricle is often displaced to the right and compressed anteriorly against the sternum by the grossly enlarged left ventricle. The posterior and left margins of the right ventricle are rendered concave by the bulging ventricular septum. The pulmonary artery and its branches usually appear normal. Opacification of the left coronary artery from the pulmonary artery is not seen. The left atrium may be normal or slightly enlarged; more marked degrees of enlargement should suggest mitral stenosis. It is often displaced to the right and superiorly by the large left ventricle. It may be rotated so that its left side is higher than the right. The left ventricular chamber usually remains opacified for a prolonged period because of its huge size and because of the slow circulation time. When rapid serial roentgenograms are obtained at the rate of 4 to 6 frames per second, the absence of effective systolic contractions is apparent. The hypertrophied left ventricular wall is seen at the base of the heart in the anteroposterior views, and in the ventricular septum in the lateral views. In contrast, the apical region shows marked thinning of the wall; its actual measurement in the roentgenogram does not exceed 2 or 3 mm. As a result of this thinning, the opacified left ventricular cavity develops a rather pointed and localized bulge at the apex. The aorta appears normal. Differential diagnosis between the Bland-White-Garland syndrome and other conditions producing left ventricular enlargement in infants can usually be made angiocardiographically by the characteristic thinning of the myocardium near the apex and by the absence of pulsation of the huge left ventricle.

Three of the 4 infants in the authors' series died, but cardiopneumopexy with phenol de-epicardialization and talc poudrage saved the life of the 4th patient, in whom the clinical findings, in conjunction with the angiocardiogram and the electrocardiogram, established the diagnosis of anomalous left coronary artery arising from the pulmonary artery. The characteristic picture found on angiocardiography in the 4 infants promises to be a valuable adjunct in diagnosis.

The Role of Aortography in the Determination of Operability in Arteriosclerosis of the Lower Extremities. E. J. Wylie and L. Goldman. Ann. Surg. 148:325-342 (Sept.) 1958 [Philadelphia].

With increasing interest in the surgical treatment of peripheral arteriosclerosis, there have been numerous inquiries concerning the place that aortography should occupy in the preoperative evaluation of patients presenting clinical manifestations of chronic arterial occlusive disease in the lower extremities. The 3 issues upon which attention has been focused involve the extent to which aortography may supplement clinical findings, the practical value of such information, and the complications that aortography may cause. To clarify these issues, the authors reviewed the records of 500 patients with arteriosclerotic obstruction involving arteries supplying the lower extremities, on whom aortography was performed. The site of injection was the upper abdominal aorta in 290 patients and the lower abdominal aorta in 210 patients. The lower level has become the site of choice for all studies except those in which clinical findings have indicated thrombosis of the abdominal aorta. Simultaneous injection through two 17-gauge needles permitted the rapid introduction of an adequate bolus of the medium, thus eliminating the possibility of hemorrhage that might have occurred if a single needle of larger caliber had been used. It was found that aortography added surgically significant supplementary information to the purely regional localization of arterial occlusion that had been determined by prior clinical examination. The information obtained proved valuable in the final determination of operability and in the selection of the site and method of operation.

PUBLIC HEALTH

An Outbreak of Pharyngoconjunctival Fever Caused by Types 3 and 4 Adenovirus at Waalwijk, The Netherlands. J. van der Veen and G. van der Ploeg. Am. J. Hyg. 68:95-105 (Sept.) 1958 [Baltimore].

This report is concerned with a localized epidemic of pharyngoconjunctival fever in The Netherlands in 1957. The outbreak occurred at Waalwijk, a town with a population of about 16,000. In July, 1957, one of the Waalwijk physicians reported that he was seeing cases of illness characterized by fever, pharyngitis, and conjunctivitis among school children. Within a few days a sharp increase in the number of cases was observed. Through the cooperation of practicing physicians and the school medical officer, the authors were able to study this outbreak. They made studies on 65 patients. The outbreak appeared to be due to adenovirus, types 3 and 4. Type 3 was isolated from 46 patients, and type 4 from 11 patients. Types 2, 5, 7, and 9 were recovered from sporadic cases of pharyngoconjunctival fever. In 63 cases both throat swab and stool were examined for adenovirus content; the stool appeared to be a better source of virus than the throat swab. About two-thirds of the cases occurred among school children, 8 to 14 years of age. Boys were attacked at a higher rate than girls. The epidemiologic observations are discussed with respect to the probable relationship of illness and irritation of the nasal and conjunctival mucosa from swimming and outdoor activities.

Adenovirus Infections in Children and Young Adults: With Comments on Vaccination. A. S. Evans. New England J. Med. 259:464-468 (Sept. 4) 1958 [Boston].

The author reports a study on 710 university students admitted to the infirmary of the University of Wisconsin between 1954 and 1958 with symptoms of acute respiratory disease. In 10% of the patients the symptoms were due to bacteria, in 10% to known viruses, and in 80% to unknown conditions. Only 7 adenoviruses were isolated, a rate of 1%: types 1, 3, 4, and 6 were identified. According to these findings, about 1 university student per 5,000 acquires a clinical illness due to adenovirus each year. A similar picture was observed in presumably healthy third-graders, aged 7 to 9 years, attending 3 public schools. Only 3 adenoviruses were isolated from 1,194 swabs obtained from 291 of these pupils. Because of these findings vaccination of the general public against adenovirus infections is not recommended. It is, however, recommended in military recruits and in persons who have intimate and prolonged contact with one another, such as inmates in mental hospitals, tuberculosis sanatoriums, and homes for the aged.

BOOK REVIEWS

Infectious Diseases of Children. By Saul Krugman, M.D., Associate Professor of Pediatrics, New York University College of Medicine, New York, and Robert Ward, M.D., Professor and Head of Department of Pediatrics, University of Southern California, Los Angeles. Cloth. $10. Pp. 340, with 51 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

The material covered in this book covers those viral, rickettsial, and bacterial infections currently met by practicing physicians in the home, office, and hospital. The chapters on the Coxsackie virus infections, viral hepatitis, influenza, acute bacterial meningitis, rubella, staphylococcic infections, toxoplasmosis, and communicable disease control, are particularly good. The one on staphylococcic infections is especially timely. The treatment of pregnant women with rubella is explained well. The value of the text would have been enhanced if an introductory chapter had been written giving current knowledge of means of isolating, identifying, and culturing bacterial, rickettsial, and viral organisms. The color plates, schematic drawings, and graphs are very well done. The text is recommended for use by the general practitioner, pediatrician, internist, and health officer.

Life Insurance and Medicine: The Prognosis and Underwriting of Disease. Edited by Harry E. Ungerleider, M.D., F.A.C.P., Director of Medical Research, Equitable Life Assurance Society of United States, and Richard S. Gubner, M.D., F.A.C.P., Clinical Associate Professor of Medicine, State University of New York College of Medicine, Brooklyn. Cloth. $16.50. Pp. 994, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book is a compilation of lectures and papers dealing with many aspects of life insurance and related topics. The 56 contributors are recognized authorities in life insurance and related fields. The text is divided into four parts. Part 1 deals with the fundamentals of life insurance. It explains not only the principles of life insurance, organization of companies, the various forms of life insurance, mortality tables and statistics, risk selection, and reinsurance but also such topics as inspection reports, internal organization of life insurance companies, the legal phases, and health insurance. Although part 2 is captioned, "Non-Medical Aspects," there are several interrelationships mentioned that involve various elements of the medical profession. These chapters deal with history and philosophy of life insurance, the relationship of longevity to insurance selection, mortality tables, numerical ratings with respect to underwriting, nonmedical underwriting, biological and social factors that influence life insurance selection, the relationship between the life insurance medical director and physicians in private practice, medical forms, medical examiners and their selection, and the internal organization of a life insurance company medical department.

To those who feel that life insurance medical directors dwell in a world apart from clinicians, part 3, entitled "Medical Aspects," makes it clear that medical directors must not only keep abreast of clinical medicine but also be able to translate these developments into their effects on risk selection, morbidity, and mortality. Impaired risks are discussed and several chapters are devoted to such diseases as diabetes, hypertension, hepatic disorders, and neoplasms. The two chapters in part 4 deal with various facets of accident and health insurance including the relatively new type of coverage called major medical. The essential differences between accident insurance and health insurance are discussed including both underwriting and claims processing. Many life insurance companies write a substantial volume of accident and health insurance, certain phases of which depend on medical evaluation. For the most part the text is well presented and edited. There are, however, a few typographical errors. For example, on page 186 in a discussion on life insurance contract clauses, it is stated "that the policy will be incontestable for two years. . . ." The text should indicate either that the policy is incontestable after two years or that it is contestable only during the first two years. This book, which is well indexed, is a valuable source and reference text covering a wide range of topics. It is recommended for those who desire broader understanding of the many responsibilities of life insurance medical directors and the interdependence between medical directors and physicians in private practice.

Diseases of the Thyroid and Parathyroid Glands. By Bernard J. Ficarra, A.B., Sc.B., M.D. Cloth. $8.50. Pp. 295, with 131 illustrations. Intercontinental Medical Book Corporation, 381 Fourth Ave., New York 16, 1958.

The following quotation from the author's introduction correctly describes this work: "This volume . . . has been published not because it is believed to contain any new revelations for the master thyroid surgeon but because it contains factual knowledge on thyroid diseases which should be made known to the general surgeon interested in thyroid

---

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

surgery. This book, therefore, is the literary product of a general surgeon who is interested in, manages, and operates upon patients with surgical disorders of the thyroid gland. It is an accumulation of knowledge gained by an average general surgeon, with an average surgical practice, in an average American community." This scholarly little book gives the chronological résumé of the history of thyroid and parathyroid diseases from 1600 to 1954. The bibliography is extensive and carefully selected. The emphasis on the pituitary thyrotrophic hormone is justifiable but the use of the abbreviation "anteritary" for anterior pituitary is not. In the theoretical discussion of the cause of exophthalmic goiter the conclusion that there is insufficient thyroid secretion to inhibit TSH production seems contradictory. It appears more likely that it is the failure of an excess of thyroid secretion to inhibit the hypothalamus that causes the disease.

From the internist's point of view this book fails to make clear that the proper treatment of nontoxic goiter is medical, and that of toxic goiter uses radioactive iodine. The discussion of isotope treatment is condensed in one short paragraph referring to a series of 22 patients. Since 1,500 such patients were reported in 1953, three years before this book was written, this seems inadequate. The management of postoperative parathyroid tetany, a lifelong disease occurring after surgical treatment of hyperthyroidism that the internist inherits from the unsuccessful surgeon, is also inadequately treated. This is nevertheless a valuable book, presenting the surgical approach to hyperthyroidism, a good chapter on exophthalmos, and a brief discussion of hyperparathyroidism.

Physical Diagnosis. By F. Dennette Adams, M.D. [Originally written by Richard C. Cabot, M.D.] Fourteenth edition. Cloth. $12. Pp. 926, with illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1958.

This well-known book has been enthusiastically accepted by physicians and students throughout the world. This edition is even more complete than its predecessors and definitely a correlative textbook, since the author has written a good synopsis of clinical diagnosis with special emphasis on the physical diagnostic signs and symptoms of disease. The general motif of the book consists of a thorough discussion, with multiple illustrations, of the techniques of physical diagnosis and of good history-taking. The author has then proceeded to explain the application of these techniques to each anatomic system, and correlated the physical signs with the anatomic and physiological alterations of the pathogenetics of the diseases discussed. He has included the laboratory data and x-ray findings wherever they are applicable. The illustrations are excellent. After discussion of each system's diseases, the author has outlined the pertinent differential diagnoses. The book is designed primarily for the medical student but it should be of great value to the neophyte physician, and even the seasoned physician may find in it many useful reminders. Reading so complete yet concise, accurate, and well-documented a book is in itself a great pleasure.

Hermaphroditism, Genital Anomalies and Related Endocrine Disorders. By Howard W. Jones, Jr., M.D., Associate Professor of Gynecology, Johns Hopkins University School of Medicine, Baltimore, and William Wallace Scott, M.D., Ph.D., Professor of Urology, Johns Hopkins University School of Medicine. Cloth. $16. Pp. 456, with 466 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1958.

Jones, Scott, and an authoritative group of contributing authors have furnished a most important and greatly needed account of the problems of intersexuality, including medical, surgical, embryologic, and psychiatric aspects. The recent interest on the part of both the laity and the medical profession in the physical and psychological problems of intersexuality should be adequately satisfied by this contribution. In 1937, the late Hugh H. Young published a classic monograph entitled "Genital Abnormalities, Hermaphroditism and Related Adrenal Disorders." The supply of this work was quickly exhausted. So much has been learned about the adrenal and its function since Dr. Young's contribution that there has developed a real demand for just such an up-to-date summary of accumulated knowledge as is now presented. Using Dr. Young's background of material, including the inimitable drawings of William Didusch, Dr. Jones, a gynecologist, and Dr. Scott, a urologist, have compiled a text which comprises all that is known and accepted on the cause and treatment of abnormalities of sexual development. The chapter on the origin of the concept of hermaphroditism in Graeco-Roman culture gives evidence of profound research and deserves its place in the histories of mythology and sculpture as well as medicine. A chapter on the recent advances in the determination of sex from a genetic standpoint by Jost should serve as a guide from both a legal and medical point of view. True hermaphroditism, a rare condition, is discussed in great detail. Only 60 authenticated cases have been reported in the past 100 years. Gonadal aplasia and dysplasia, Klinefelter's syndrome, male hermaphroditism, and female hermaphroditism due to congenital adrenal hyperplasia are thoroughly discussed from both scientific and practical aspects. Endocrine tumors of the testis, feminizing adrenal cortical tumors in males, and the radiologic diagnosis of adrenal tumors are illustrated by case reports and clinical data. Surgery of the adrenals is well described. This monumental contribution on an unusual but interesting group of subjects should stand as authoritative for many years.

QUESTIONS AND ANSWERS

CHEST X-RAYS FOR SCHOOL PERSONNEL

To the Editor:—*The problem of regular chest x-rays for personnel who work intimately with children in the schools has come up this year. Present practice includes the submission of a report of negative chest x-ray findings by Nov. 15 of each year. The teacher (or classified employee) may submit a report of current negative results on skin testing for tuberculosis in lieu of the chest x-ray report if he so desires. Of course, if the skin test shows positive results, he will have to go through with the x-ray anyway. Are there any recent developments which might provide a better approach to this problem of adequately safeguarding the children? Are there any comments —pro or con—on the approach here outlined?*

H. Veazie Markham, M.D., Torrance, Calif.

Answer.—The practice of requiring school personnel to submit evidence of freedom from active tuberculosis as a condition of employment is growing in the United States. Such procedures not only safeguard the health of children but also promote the fitness of school personnel. The procedure of requiring a negative finding on skin test for tuberculosis or a chest x-ray when this is known to be positive seems to be in keeping with present recommended practices. In some places, the routine chest x-ray is preferred because it may disclose other conditions, as well as being helpful in tuberculosis case finding. Also, when the incidence of tuberculosis in an area is relatively high, routine chest x-ray may be the most economical approach. Since local conditions and recommendations vary, consultation with state and/or local health departments, tuberculosis association, and medical society is recommended. Local understanding and interpretation, as well as clarification of procedures, will be furthered through this process. Regardless of method, it is well to include in an accompanying educational campaign reassurance as to the use of x-ray in the process. Misleading statements have been made, and misinterpretations of factual observations have aroused needless fears concerning the medical use of x-rays. It is, therefore, important to point out that only minute amounts of radiation are employed and that these are very unlikely to reach the gonads. One wonders about the Nov. 15 date mentioned in the question. For purposes of administration, as well as protection of children and associates, the opening date of school in the fall might be a more satisfactory deadline.

DUODENAL ULCER AND BILIARY TRACT DISEASE

To the Editor:—*Is there any possibility that the development of a duodenal ulcer could be caused or contributed to by previous biliary tract disease or biliary tract surgery?*

J. Manly Bryan, M.D., Canyon, Texas.

Answer.—Previously, it was believed and taught that duodenal ulcer and gallbladder disease did not exist in the same individual because of varied constitutional characteristics for each of the two diseases. This is an error; the two diseases do coexist in the same person, and, when they do, it is usually the ulcer and not the gallbladder that is responsible for the symptoms. The mere fact that gallstones or cholecystitis is present in a patient with ulcer does not signify that the gallstones or the gallbladder disease is causally related, but at times the inflamed gallbladder may become adherent to the duodenum. Apart from the mechanical contiguity, there is no etiological relationship between the two diseases. The inflamed gallbladder does not aggravate the ulcer, nor does the ulcer have any relationship to the gallbladder. At times the gallbladder may perforate through the second portion of the duodenum (even resulting in gross hemorrhage). It is through this fistulous opening that large gallstones make their way into the small intestine and eventually cause a gallstone obstruction.

As for biliary tract surgery, a persistent external biliary fistula surgically treated for the relief of biliary obstruction might divert enough of the alkaline pancreatic juices from the duodenum as to make possible the formation of a duodenal ulcer.

Answer.—There seems to be no definite evidence that previous biliary tract disease or biliary tract surgery has anything to do with the development of a duodenal ulcer. Occasionally, a roentgenologic deformity of the duodenum resembling a duodenal ulcer may be reported in persons who have had previous biliary tract surgery, and a duodenal ulcer may be associated with biliary tract disease. Occasionally, at the time of abdominal exploration, the deformity has been found to be due to adhesions between the gallbladder area and the duodenum and a true ulcer does not exist. The

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

deformity has been noted to disappear when the adhesions were cut. While duodenal ulcer and biliary tract disease may be found in the same individual, there is no definite evidence that the ulcer is the result of biliary tract disease.

HEADACHES

To the Editor:—*A 48-year-old man complains of intense headache during coitus. The severity of the headache begins to subside about five minutes after orgasm. Occasionally, the headache is experienced with bowel movement. What might be the cause, and what treatment should be given?*

M.D., Maryland.

Answer:—Etiological possibilities include migraine, hypertension, and psychogenic or emotional factors that produce stress. Allergy to food or something in the environment may be present. The condition may be due to nasal congestion normally occurring during coitus superimposed on nasal or sinus allergy or pathology. These effects may be accentuated by excessive smoking associated with drinking. Toxic states or endocrine or biochemical factors may be at the root of the trouble. Other causes may be skull tumor, pheochromocytoma, and aneurysm, among others. For migraine, treatment consists of a combination of ergotamine tartrate and caffeine. For psychogenic or emotional factors, analgesics and psychotherapy are used. In allergy, desensitization or avoidance is the key. For nasal congestion, vasoconstrictor nose drops and analgesics are effective. The other conditions obviously require special investigation and treatment.

ORAL SURGERY DURING ANTICOAGULANT THERAPY

To the Editor:—*It is becoming increasingly more common to encounter patients who are on long-term anticoagulant therapy and who require extraction of teeth or other oral surgery. One approach to this problem has been to withdraw the anticoagulant about 48 to 72 hours preoperatively, perform the extractions, and then reinstitute anticoagulant administration 24 or more hours later. Some insist on prothrombin time determinations for confirmation; others do not. Vitamin K_1 is recommended by some and not by others. Still others feel that the dangers of thrombosis far outweigh the problem of postextraction hemorrhage and prefer that anticoagulant therapy not be discontinued. This latter group is of the opinion that local bleeding from an extraction wound can be managed by local measures. Please give comments and suggestions.*

M.D., New York.

Answer.—Patients on anticoagulant therapy will show a strong tendency toward prolonged hemorrhage. This risk must always be considered when oral surgical procedures are contemplated. It is little appreciated that blood loss during some oral surgical procedures is comparable with that occurring in major surgical procedures. Experience at the New York Veterans Administration Hospital indicates that anticoagulant drugs be withheld before dental operations (Ziffer and others, *New England J. Med.* 256:351, 1957). Prompt resumption of therapy when hemostasis has been obtained will result in minimal interruption of anticoagulation therapy. The patient's oral surgeon and physician, or cardiologist, should determine after consultation the treatment plan for the individual patient relative to the cessation of anticoagulant therapy and/or vitamin K administration. The oral surgeon should not assume the responsibility for the discontinuance of anticoagulation therapy.

CONTRECOUP BRAIN DAMAGE

To the Editor:—*A 75-year-old man was struck over the forehead in an accident. He was unconscious for a short length of time. X-rays revealed no fractures. After the accident he complained of unsteadiness and severe frontal headaches; these have persisted. He has also complained of profuse discharge from his nose, mouth, and eyes only when eating. This phenomenon has persisted. Audiometric tests revealed bilateral severe nerve deafness. Findings in vestibular function studies (caloric stimulation) were normal. Neurological examination findings were entirely negative. The nasal discharge, which was clear, was tested for presence of cerebrospinal fluid, with negative results. Examination immediately after the patient had taken a few bites of food revealed a profuse clear discharge from the middle and superior turbinal areas in each side of the nose. The mucosa appeared to be normal. A profuse discharge of clear saliva could be seen issuing from each Stensen's and Wharten's ducts. In addition, a profuse epiphora concurred. A search of the literature has been unrevealing for the pathoanatomic basis of this phenomenon. Please supply information on this.*

Joseph Freeman, M.D., Miami, Fla.

Answer.—It is likely that the finding of severe bilateral nerve deafness is the key to the explanation of the phenomena described. It is well known that trauma to the forehead can, by contrecoup, damage petrous pyramid structures bilaterally without a demonstrable fracture of the base of the skull. The equivalent of a contusion is produced and later organized as a scar, with or without bony thickening in the damaged area. The bilateral nerve deafness is probably related to trauma in and beyond the tractus spiralis foraminosus at the fundus of the internal auditory meatus. Just superior to the falciform crest of the internal auditory meatus is the facial nerve, and at the nearby genu is its geniculate ganglion. The nervus intermedius carrying efferent parasympathetic secretory fibers to the submaxillary ganglion and to the sphenopalatine ganglion, and afferents through geniculate ganglion fibers to the nucleus of the tractus solitarius, would be just as vulnerable as auditory fibers. So would the preganglionic parasympathetic fibers of the small superficial petrosal nerve, which tunnel from the middle ear to the anterosuperior face of the petrous pyramid very close to the geniculate ganglion and facial hiatus on the way to the otic ganglion. The latter structure supplies postganglionic parasympathetic secretory fibers to the parotid gland. Damage in the areas described could produce all of the symptoms noted including the epiphora, which is induced by orbital branches of the sphenopalatine ganglion.

ALKALI THERAPY WITH PAS

To THE EDITOR:—*In the treatment of tuberculosis, when PAS is being given in the usual dosage of 12 Gm. per day, is one justified in using an alkali, such as magnesium trisilicate and/or aluminum hydroxide, to allay stomach distress? Does the alkali interfere in any way with the potency of PAS?*

E. K. Disney, M.D., Dawson Springs, Ky.

ANSWER.—There is no objection to giving a compound such as magnesium trisilicate–aluminum hydroxide to a patient who is on PAS regimen; it would be better to give it at a different time, however. The alkali does not interfere with the potency of PAS. To patients who are very distressed by one form of PAS, the calcium salt may prove less irritating.

LIVER FUNCTION TESTS AND CHOLECYSTOGRAPHY

To THE EDITOR:—*Please give information on the correlation between liver function tests, specifically, sulfobromophthalein excretion, and oral cholecystography. A patient, not jaundiced, has normal findings on liver functions tests; however, cirrhosis is strongly suspected. This patient shows no shadow after being given gallbladder dye on repeated occasions. Also, in other patients with mildly impaired liver function, according to liver function tests sometimes no dye is found in the gallbladder. Have any studies been done on correlating these two methods of examination?*

R. F. Hartwich, M.D., Winona, Minn.

ANSWER.—Several studies have been made and published on this point. It has been shown that, when liver function is sufficiently impaired, even in the absence of jaundice, the gallbladder dye is not properly extracted from the blood. As a result, the gallbladder is visualized poorly or, perhaps, not at all. It is somewhat difficult to accurately predict the degree of liver damage necessary to influence gallbladder visualization. Since sulfobromophthalein is extracted from the serum in a somewhat similar manner as gallbladder dye, the results of this test correlate better with those of gallbladder visualization than any other. Sulfobromophthalein retention of over 20% is usually associated with a dim or absent gallbladder shadow. On the other hand, in the presence of active inflammation in the liver, as indicated by positive findings on flocculation tests, one may have a dim shadow even though the sulfobromophthalein retention is only 7 or 8% at the end of 45 minutes.

VITAMIN C

To THE EDITOR:—*What is the difference between vitamin C from natural sources and the synthetic vitamin C—ascorbic acid—in regard to human metabolism in the so-called normal individual and in the patient with wound healing after operation?*

W. Forrester Maley, M.D., Chicago.

ANSWER.—Vitamin C is a specific chemical entity, and, therefore, the body is unable to differentiate between sources of this chemical (ascorbic acid). Whether the body obtains its vitamin C from synthetic ascorbic acid or from orange juice, the manner in which this substance is utilized by the body is exactly the same. Vitamin C is used by some physicians in quite massive doses postoperatively, but apparently the rationale for such administration is open to question. The following quotation, taken from the book "Modern Nutrition in Health and Disease" by Wohl and Goodhart (Philadelphia, Lea & Febiger, 1955), sums up quite accurately the current concept of the role of vitamin C in patients after operation.

> Large doses of ascorbic acid have been used by many surgeons in their post-operative patients in order to facilitate the healing of surgical wounds. This idea was based on the observations that stress situations like surgical operations and severe burns about the body lowered the serum ascorbic acid level and that ascorbic acid concentrated in the connective tissues about healing wounds. It was based also on the well-known clinical experience that scurvy impairs wound healing. However, more recent data indicate that ascorbic acid metabolism is in a state of flux in post-operative patients, and that the serum levels do not correlate well with platelet, white blood cell (buffy coat) levels.

	Ascorbic Acid (Mg. %), Av.		
	Buffy Coat	Whole Blood	Plasma
20 normal persons	15.2	0.73	0.69
200 surgical patients	14.5	0.48	0.36

> Levels in the anterior rectus fascia below 1.5 mg. per cent indicate significant deficiency and are usually correlated with plasma levels of less than 0.2 mg. per cent. Plasma levels above 0.2 mg. per cent in such surgical patients usually indicates adequate tissue saturation. Only when the buffy coat ascorbic acid concentration falls to very low levels is there danger of wound disruption, and examples of this difficulty

are extremely rare. From the experimental evidence available at present, it would appear that the low plasma ascorbic acid level in patients just subject to a stressful procedure like major surgery is due to redistribution of ascorbic acid within the body rather than to an actual deficiency of the vitamin. A similar phenomenon occurs in iron and vitamin B-complex metabolism.

COMPLICATIONS OF ROUTINE LAPAROTOMIES

To the Editor:—*How frequently is spontaneous pneumothorax unexpectedly encountered during routine laparotomies (e. g., appendectomy)? How frequently does this condition complicate therapeutic pneumoperitoneum? How frequently does it complicate therapeutic or spontaneous pneumothorax?*

Joseph W. Kimbrough, M.D.,
Albuquerque, N. Mex.

Answer.—None of several general surgeons who have large surgical practices can remember encountering pneumothorax as a complication of routine laparotomies unless there has been some surgical injury to the diaphragm. If such a complication should occur, it may be due to the rupture of a small bleb on the lung rather than to any air from the peritoneal cavity entering the pleural cavity. In a long experience with artificial pneumothorax and pneumoperitoneum, this consultant can recall only one case in which there was diaphragmatic hernia. It is not felt that diaphragmatic hernia can in any way be related to artificial pneumothorax or pneumoperitoneum. If a diaphragmatic hernia with a peritoneal sac is already present, one would expect air from a pneumoperitoneum to enter this sac, and, if a traumatic diaphragmatic hernia were present without a sac, one would expect the air from the peritoneal cavity to enter the pleural cavity. In one instance the pneumoperitoneum was done as a therapeutic procedure in an attempt to locate the diaphragm. When the x-ray was taken with the patient in the upright position, there was no air in the abdomen but there was a well-defined pneumothorax. At operation, a large rent in the diaphragm was found which made a direct connection between the peritoneal and pleural cavities.

UNUSUAL MEDICAL QUESTIONS

The Questions and Answers Department of The Journal *receives many letters describing unusual cases. Some of these are too detailed to be printed in the regular Questions and Answers section. From time to time those that represent apparently new or different clinical syndromes or other interesting medical data will be presented in this section of* The Journal.—Ed.

BRONCHOSCOPY AND BRONCHOGRAPHY

To the Editor:—*Please discuss the indications for and safety of bronchoscopy and bronchography. What determinations, such as that for vital capacity, should be done first to see if and how much the patient can tolerate these procedures—especially the aged? What is the accepted treatment for bronchiectasis? Is repeated bronchoscopy each time a patient has an upper respiratory infection good treatment? Is aerosol penicillin used for chronic lung infection? M.D., Iowa.*

Answer.—The ability of a patient to tolerate bronchoscopy is based on an evaluation of the respiratory reserve. It is contraindicated if the information to be gained is minimal in the light of the potential dangers of the procedure, such as in true bronchiolitis in an infant; acute generalized pneumonitis where the presence of a foreign body has already been ruled out by the history and findings; the presence of a severely narrowed laryngeal or tracheal airway, except when the bronchoscope is passed through the larynx to establish a comfortable airway while the tracheotomy is being performed; and an obviously inoperable carcinoma of the lung in which x-ray therapy also is contraindicated because of the patient's poor health (this state of affairs is exceedingly rare). Bronchoscopy is also contraindicated in patients with uncontrollable coughing, if the dyspnea is severe when the patient is at rest and lying down, when dyspnea is initiated from the effort of sitting up, and when the patient is able to speak only a few syllables with each breath. It is risky if the severe dyspnea is associated with cor pulmonale and with hemoconcentration. The procedure is dangerous if severe dyspnea is associated with cardiac decompensation or coronary insufficiency. The bronchoscopist must be particularly adept, working without trauma but with agility; he must be willing to stop before completion of examination in certain instances, such as dyspnea with pulmonary emphysema, where the back-pressure of breathing against the larynx is necessary for adequate filling of the alveoli with air, a need for the employment of a mechanical aeration-assist, as in bulbar poliomyelitis, and the presence of wheezing or other evidence of bronchospasm during procedure. He must also be willing to stop during or after previous procedures (bronchodilators may be used as necessary). Bronchoscopy is hazardous if the vital capacity is less than half of normal or if the maximum breathing capacity is less than twice the tidal air on quiet breathing. As a matter of fact, tracheotomy often is safer when the patient is "loaded" with secretions, but one should be prepared for mechanical respiratory assistance during and after the procedure if the patient needs carbon dioxide stimulation to breathe, i. e., if increased oxygenation causes irregular breathing, apnea, or other changes. The ability of the patient to tolerate bronchography is based on an evaluation of all factors mentioned under bronchoscopy, plus contraindications set by sensitivity to materials to be used for the bronchogram, such as iodine or iodide sensitivity discovered by the history and by testing and local reaction or burning when a small amount is introduced into the conjunctival sac or when a small amount is held in the mouth and by sulfonamide sensitivity on the basis of the history, when sulfonamide-iodized oil combinations are to be employed. Under such circumstances it is well to use another agent. Even more so than in bronchoscopy, bronchography is contraindicated if the potential dangers equal or exceed the probable benefits of this solely diagnostic procedure. The procedure should not be carried out if the pulmonary secretions are too abundant to allow adequate anesthesia and control of cough by anesthesia when the patient is unable to withhold coughing or to permit adequate filling of the tracheobronchial tree by the bronchographic agent or adequate filling without producing dyspnea. It is contraindicated if suppuration is bilateral and not amenable to surgery. Medical management of a marked suppurative bronchitis is essentially the same as for bronchiectasis. Therefore, the risk of bronchography is not entirely justified. Concerning special tests, the clinical evaluation of the patient is superior to any tests when the potential dangers of these procedures are considered. These include the evaluation of vital capacity, maximum breathing capacity, and other functions as previously mentioned.

Present therapy for bronchiectasis includes surgical as well as medical modalities. Surgical removal of the affected part of the lung is indicated where the disease involves something less than one-half of the 19 bronchopulmonary segments and particularly in the younger age group (under 35 or 40 years), since the life expectancy would be increased by segmental removal in two or three separate operations if the disease is extensive. This is especially so in saccular rather than in cylindrical bronchiectasis. Medical management needs to provide effective drainage of secretions by means of humidification of respiratory passages, postural drainage, a correctly used cough machine or intermittent positive-pressure breathing machines, expectorants, and mechanical aspiration, when necessary. Evaluation and treatment of allergic states is a factor in many patients who are resistant to other therapy (approximately 10% are in this group). Employment of bronchodilators is in order when wheezing or other evidence of bronchospasm is observed. Parenterally, epinephrine, aminophylline, and the like may be given, as well as aerosols, including levarterenol, amphetamine, or epinephrine. These are listed in the order of increasing side-effects on the cardiovascular system. In the category of relatively specific therapy, antibiotics administered by the parenteral route are more effective than those given by aerosol. Tetracyclines, alternating with the combination of oleandomycin and penicillin, seem particularly effective. Other antibiotics are administered on the basis of apparent improvement of the patient. It is frequently helpful to change the antibiotic after two weeks. Employment of autogenous vaccines helps only some patients. These seem most helpful in cases of staphylococcic infections. Repeated bronchoscopic aspiration in patients with chronic suppurative lung disease at the time of upper respiratory infection requires comment. The procedure is contraindicated in the acute phase, because it may result in a more severe infection or may bring about respiratory embarrassment due to edema. It is, however, frequently helpful in the subacute stages of the infection. Aerosol penicillin in chronic lung infection is still considered to be of some value, but less effectively so than the parenteral administration of antibiotics. Penicillin should be rotated with other antibiotics, e. g., every two weeks, in order to avoid the creation of resistant infections. Some clinical investigators claim this method to be relatively valueless, based in statistical consideration of large groups of patients with bronchiectasis.

ICY COLD NOSE

To the Editor:—*A 43-year-old woman, healthy in all respects, is going through the menopause normally but gets apparently intractable headaches. These are generalized and, sometimes, behind the eyes. With these headaches, which are quite frequent, her nose always gets cold as ice, which, of course, has to do with the sympathetic nerves. Her IQ is excellent, and she is mentally stable. Can "smog" or dust cause these headaches? What is suggested in the way of further investigation? Milton I. Steckler, M.D., Los Angeles.*

Answer.—There seems to be no evidence whatsoever of any allergic foundation for the patient's headaches or for the fact that her nose gets "cold as ice." A complete blood cell count should be done, with reference to eosinophilia, and, also, a nasal smear should be obtained if the nose is at all moist. If she has any nasal allergy, it should show itself on examination. In such cases, the nasal mucosa is usually pale and boggy. Polyps may or may not be present along with this. If a nasal smear showed 4% or more eosinophils, then the patient should be given complete skin tests and the condition evaluated from the allergic point of view. From the history given, it appears that these headaches are of the tension type and related to the menopause.

Answer.—A specific syndrome consisting of intractable, generalized headaches associated with an icy cold nose has not been reported in the literature. It might be postulated that since the cold nose is a vasomotor phenomenon the accompanying headaches are probably vascular in origin. Allergy to house dust may produce at least two types of headache. One is the nondescript, generalized headache which may correspond, in part, with the description in the question. This type of headache is believed to be due either to change in caliber of cerebral vessels or to actual edema of the brain. Many allergists believe that these occur most commonly in patients with food allergy, but they have also been reported as the result of allergy to inhalants. Smog, particularly in a patient with sensitive nasal mucosa, may act as a nonspecific irritant and produce a pseudosinus type of headache, usually associated with nasal stuffiness and watering of the eyes. This type of headache may also be produced by allergy to house dust. Assuming that the more conventional and more obvious causes of headache have been ruled out, further investigation to establish the cause of the headaches described should include allergy investigation. Simple allergy skin tests will quickly exclude the possibility of house dust as a cause. Whether further allergy investigation is necessary depends on the results of the screening tests and the history, particularly that of associated manifestations of allergy. Response to therapy and deliberate provocation of the headaches are often helpful as aids to diagnosis. Thus, the effects of vasoconstrictors and antihistamines on the symptoms should be investigated. Also, an attempt to reproduce the syndrome by vasodilators and suspected contacts may be indicated. It is patently impossible in this response to discuss in detail the difficult, and often controversial, differential diagnosis of headaches in connection with the syndrome described. For good reviews, the questioner is referred to Ogden (*Ann. Allergy* 14:384, 1956) and Graham (*DM*, p. 1, Jan., 1957).

HYPOFIBRINOGENEMIA

To the Editor:—*A 28-year-old woman delivered her fifth child in December, 1957. Prior to this pregnancy she had some menstrual irregularity with occasional intermenstrual bleeding. On April 16, 1958, she was admitted to the hospital with a complaint of leukorrhea, and a dilatation and curettage, cervical biopsy, and cauterization of the cervix were done. The tissue specimen showed chronic cervicitis, with erosion and proliferative endometrium, with mild congestion and edema. After these procedures were performed, bleeding occurred, and on May 7, 1958, she was readmitted for control of heavy bleeding. She was given transfusion, dilatation and curettage and cervical biopsy were done, and the cervix was cauterized. The tissue specimens showed acutely and chronically inflamed endometrium in the secretory phase and chronic cervicitis and endocervicitis. Cauterization was done several times as an office procedure in an attempt to stop the bleeding. Bleeding and clotting times were checked and found to be normal. In the operating room she was found to have active oozing from an area of cervicitis. This area was excised and closed with sutures. Dilatation and curettage were done, and an old laceration of the cervix was repaired. The tissue specimen showed glandular hyperplasia of the endometrium, with foci of acute inflammation, and chronic endocervicitis with erosion. At the end of this procedure there was no bleeding, but several hours later she began bleeding and now it became heavy, with large clots. Platelet count and prothrombin activity were normal. Her blood formed what appeared to be a good clot. She was given transfusion, phytonadione was administered intravenously, and the bleeding almost completely stopped. When she began bleeding heavily again, the fibrinogen level was checked and found to be 40 mg.%. She was given a fresh transfusion and two units of fibrinogen. The bleeding stopped, and, at the time of writing, the cervix appears to be healing well and she has had no bleeding for more than 10 days. After receiving the second unit of fibrinogen, the level was 350 mg.%. Total protein level was 7.8 Gm.%, albumin level 4.5 Gm.%, globulin level 3.3 Gm.%, and findings on cephalin-cholesterol flocculation test negative. Her thymol turbidity was 2.3 units. What is the probable cause of the low fibrinogen level? Is it related to abnormality of the uterus? What can be expected in the future and in the event of future pregnancy?* *M.D., New York.*

Answer.—The occurrence of hypofibrinogenemia in this patient is most unusual. This syndrome is generally associated with premature separation of the placenta, criminal abortion, a dead fetus, and, occasionally, severe toxemia of pregnancy. The fibrinogen level of 40 mg.% is in the range where clotting and prothrombin times should have demonstrated some abnormality. It is possible that there is a retained placenta which is elaborating either thromboplastic or fibrinolytic substances. However, in any event, this patient's condition should be evaluated from the standpoint of either a fibrinolytic disturbance or a circulating anticoagulant. It might be expected that this disturbance will return if the primary mechanism is either uterine or ovarian pathology. In this event, surgery may be necessary. Prior to any surgical procedure, adequate investigation for a coagulation disturbance of the type described above should be performed (see Stefanini and Dameshek, Hemorrhagic Diseases, New York, Grune & Stratton, Inc., 1955; Biggs and MacFarlane, Human Blood Coagulation, Springfield, Ill., Charles C Thomas, Publisher, 1957).

EMOTIONAL PROBLEMS FOLLOWING ORGANIC BRAIN DISEASE

To the Editor:—*The answer to the question on emotional problems following organic brain disease, in* The Journal, *Sept. 6, 1958, page 136, might lead the reader to draw some erroneous conclusions both about the nature of psychotherapy in general and about the particular problem in question. Thus, it is stated, "A person . . . can be helped by psychotherapy insofar as he is a reasonable individual." While it is true that the psychotherapist allies himself with the rational portion of the personality, the process of therapy is basically much less one of reasoning with the patient than of resolving, as much as possible, emotional conflicts that stand in the way of his using his reason. To dismiss a cerebral hemorrhage simply as a "lobotomy" ignores the interplay between the specific psychological structure (personality) which the patient brought to his illness and the psychological impact on this particular person of the catastrophe that has befallen him.*

Certainly, the psychotherapy of persons with organic brain damage has not been much explored, but some work has been done and published, for example, "Psychotherapy in the Treatment of Organic Brain Disorder Following Cerebral Vascular Accident," by Wesselius (Bull. Menninger Clin. 18:97, *1954). Though "any standard textbook on psychotherapy" might give the essential techniques, as suggested by the consultant, one would have to individualize the approach according to the patient's past history and present reactions to his illness.*

Aaron Paley, M.D.
1725 High St.
Denver 18.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*The correspondent states that "the reader might draw some erroneous conclusions both about the nature of psychotherapy in general and about the particular problem in question." There are many schools of psychotherapeutic thought, but it is an accepted truism that the patient subject to psychotherapy must have an adequate amount of reasoning power. One does not carry out an extended course of constructive psychotherapy with a feeble-minded individual. As was previously stated, the individual must know his limitations and live within those limitations. Otherwise, he will create a great deal of emotional conflict because of his frustration. It is the battle to avoid frustration and guilt that causes emotional conflict.*

It is, of course, true that the personality resulting after a cerebral hemorrhage is dependent on the "psychological structure" which the patient had before his illness. No doubt such a cerebral hemorrhage would increase the patient's sense of frustration. If he were mature, with a well-integrated personality before the catastrophe, then he would be more apt to have an adequately integrated personality after the accident. Again, it has been observed that anything that removes the higher centers of the brain may remove emotional control and, perhaps, remove the sense of guilt. It is emphasized that the therapist must have an understanding of fundamental psychotherapeutic principles if he is to handle any emotional problem toward helping the patient adjust to a handicap.

POSTVACCINAL POLYNEURITIS

To the Editor:—*In the Aug. 30, 1958, issue of* The Journal, *page 2258, a question was asked concerning acute infectious polyneuritis after intradermal injection of Asian influenza vaccine. The reply indicated that, to the knowledge of the consultant, this had never occurred. A 26-year-old woman received 0.5 ml. of monovalent Asian influenza vaccine which was followed by mild local reaction for two days; one week later this was repeated and was followed, in addition to the local reaction, by a moderately severe myeloradiculitis, commencing 12 hours after the injection and gradually subsiding over the course of the next two weeks. The details of this were briefly mentioned in the C. D. C. Influenza Surveillance Report no. 20, Oct. 8, 1957. It is probable that the true incidence of mild neurological reactions to formalinized viral vaccines is unknown.*

Alex J. Steigman, M.D.
University of Louisville
Louisville 2, Ky.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*Actually, this consultant rather hoped that the answer would bring forth such information, since it was stated that "a polyneuritis could possibly follow vaccination for Asian influenza." However, it should be pointed out that, in the case reported in the comment, the myeloradiculitis followed not a single injection but two injections given one week apart, indicating a sensitivity process. This type of reaction would be much more likely to occur after two injections.*

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Medicare Contracts to Be Renegotiated by Mail . .

Democratic Party Advisors Back Hospitalization Under OASI . .

10 Diseases Show Decline in 1957 . .

MEDICARE WILL RENEGOTIATE CONTRACTS BY CORRESPONDENCE

The Office for Dependents' Medical Care (Medicare) has decided to renegotiate state contracts with physicians' representatives by mail next year instead of through conferences. Contracts will be for one year, as in the past.

Announcing the new procedure, Brig. Gen. Floyd L. Wergeland, in charge of Medicare for the services, sent the following letter to all contractors:

"The negotiation and renewal of all Medicare contracts for the calendar year 1958 has been completed. As you are aware, these negotiations involved 'a comprehensive examination and analysis of the maximum fees to be paid physicians participating in Medicare. The matter of administrative costs was not an issue during these negotiations as the adjustment of these costs for the initial contract period was made to the mutual satisfaction of the government and the contractor in every instance.

"In view of this background, we propose the extension of our present Medicare contracts for a period of 12 months, beyond their expiration dates in 1959. This is to be accomplished through the medium of correspondence. We will send Medicare contractors a proposed modification 45 to 60 days before the expiration of each of the respective contracts. Upon receipt of these proposed contract modifications, if acceptable to the contractors, it is requested that they be duly executed and returned to this office for execution by the contracting officer, after which copies will be returned to the contractors. However, if you do not agree with the proposed contract modification, please notify the contracting officer at once in order that any differences may be resolved."

DEMOCRATIC ADVISORY COUNCIL SUPPORTS FORAND LEGISLATION

The Democratic Advisory Council, which gives formal and informal advice to the party's Congressional leaders, favors enactment of a hospitalization program under social security (the Forand Bill), which was opposed by the American Medical Association at the last session of Congress.

The council included this recommendation among many others in a lengthy statement of comments and proposals drawn up at a meeting in Washington. The session was called to evaluate voter trends in the recent election and recommend a course for the predominantly Democratic 86th Congress that convenes Jan. 7.

However, there is no assurance that the party's leaders in Congress will accept all recommendations. When the council was formed two years ago, appointments were offered to 10 members of Congress, including House Speaker Rayburn and Senate Leader Johnson. Senator Johnson and Representative Rayburn declined to serve, as did all but two of the others.

On the Forand hospitalization proposal, the council declared:

"The following increased benefits and hospital care program should be adopted as the next several steps in insuring a secure life for our people:

"Increase social security tax payments by one-half of one per cent, split 50-50 by employers and employees, to finance hospital and nursing insurance for aged persons and other social security beneficiaries, including:

"1. Hospital care for 50 to 60 days per year.

"2. A limited amount of nursing service."

The council also proposed that the age limit of 50 years for disability payments under social security be eliminated, as "a disabled person is disabled whether he is 25, 40, or 50 years old." Other social security proposals would increase benefits 10% immediately and another 10% in the next three or four years, improve widow's benefits, increase the earnings ceiling on which OASI taxes are applied from the present $4,800 to $6,000 in the next two years and to $7,200 by 1962 or 1963.

An enlarged program of hospital construction (the Hill-Burton program) was proposed as well as loans to local comprehensive health insurance cooperatives. On the latter point the report comments: "This will provide the basis for the development and enactment of a comprehensive and integrated program for the insurance, protection, and improvement of the health of all of our people."

A "steady effort" to increase funds for medical research was recommended.

In a general statement, the council declared: "Thus, we are called upon not only to keep up with the many demands of growth and change, but also to overcome the backlog of unmet needs that the Republican administration has allowed to pile up. Our list of what is needed must perforce be an extensive one.

"Under our Constitution, we will have a Republican administration for two more years. The Congress must of necessity cooperate with this administration. The effort must be to lead the administration into doing the best of which it is capable.

"While we may expect the administration to continue to try to block some needed measures, the increased Democratic majorities in both Houses of Congress provide better means to overcome such opposition. While it will undoubtedly be impossible for the Congress to overcome administration objection to do all that should be done, it should now be possible to enact desirable legislation that the administration has previously defeated and to put through a larger portion of a clear and comprehensive Democratic program."

TEN DISEASES DOWN IN INCIDENCE FOR 1957

Final figures on the incidence of notifiable diseases in the U. S. for 1957, compiled by the National Office of Vital Statistics, show a substantial reduction compared with 1956 in 10 diseases. They are brucellosis, diphtheria, encephalitis, hepatitis, malaria, poliomyelitis, psittacosis, trichinosis, tuberculosis, and typhoid fever.

Substantial increases were reported for amebiasis, other types of meningitis, and streptococcic infections. Diseases which showed little change in reported incidence were dysentery, rheumatic fever, meningococcic infections, and venereal diseases.

Cases of poliomyelitis totaled 5,485, which was lower than the number reported for any year since 1942, when the total was 4,167. The agency said the highest proportion of paralytic cases (79%) in any age group was in the one-year group.

MEDICAL SCHOOL CONSULTANTS HOLD FIRST MEETING

The surgeon general's consultant group on medical education held its first meeting early in December and assigned several staff studies looking to an eventual answer to the basic question of how many doctors are needed in the next decade. The group holds its second meeting in February. It set up a steering committee to work with the staff between regular meetings.

On the committee are Frank Bane, chairman of the 21-man consultant group; Dr. Edward L. Turner, American Medical Association; Dr. Ward Darley, Association of American Medical Colleges; Emory W. Morris, DDS, president of the W. K. Kellogg Foundation, and the Very Rev. Robert J. Slavin, president of Providence (R. I.) College.

Staff studies under way are construction costs of recently established medical schools and the financing of medical school operations.

MISCELLANY

For the first time since World War II the estimated number of veterans is showing a consistent downward trend, according to VA. On Sept. 30, there were about 22,723,000 veterans in civil life, the sixth straight month the veteran population has shown a decrease. Barring another war, the decline will continue unless there is an unforseen increase in the discharge rate of Korean war veterans, VA notes.

Veterans Administration and American Cancer Society are sponsoring a program for testing a method of mass screening of population groups for incipient lung cancer. About 8,500 residents of six VA domiciliary homes will be screened twice a year by use of the sputum cell analysis method, plus chest x-ray films. The VA said it will enable doctors to determine the extent of correlation between history of smoking, symptoms of bronchial and lung irritations and infections, and development of lung cancer in residents of the homes.

Social Security Administration is trying to reach about 400,000 persons who may be eligible for payments under the 1958 amendments to the social security law. An intensive effort is being made by the Bureau of Old Age and Survivors Insurance and its 584 district offices to reach newly eligible persons and inform them that claims must be filed before benefits can start. SSA said in many cases it cannot identify or locate the eligibles.

Brig. Gen. Harold H. Twitchell is the new president of the Association of Military Surgeons. He is command surgeon of the U. S. Air Forces in Europe, located at Wiesbaden, Germany.

Three hundred representatives of colleges and universities in the central Atlantic area and Puerto Rico and the Virgin Islands attended a Washington, D. C., conference on the new national defense education act. Discussions dealt largely with loans to students, graduate fellowships, counseling and guidance institutes, and foreign language development. The law provides U. S. aid to educational institutions in all these areas.

Food and Drug Administration reports the seizure of 14 drugs and medical devices in October, 11 for alleged false and misleading claims. Three were vibrator devices offered as weight reducers. Shipments of a brand of cigarettes advertised as an aid in weight-reducing also were seized at Cleveland, Kansas City, Mo., Glendale, Calif., and Trenton, N. J.

Activities of the Army Medical Service reserve program were discussed at a two-day meeting of an advisory committee to the Army surgeon general. One of the reports was from retired Major Gen. Earle Standlee, staff director of the American Medical Association's Commission on National Emergency Medical Care.

A kit of guidance materials from the President's Committee on Scientists and Engineers will be sent to every junior college and similar institutions. The kit was given final approval by a special conference called to review its contents. The objective is to interest students at the precollege level in careers in science and engineering.

College and university enrollment for the current fiscal year has set another all-time record—3,258,556. The U. S. Office of Education says this is 6.2% more than last school year and the seventh consecutive year in which a new record has been set.

National Science Foundation announces a new program of summer fellowships to give secondary school teachers an opportunity for further graduate study and research in the sciences. About 750 fellowships will be offered. Information is available at the Teacher Program, American Association for the Advancement of Science, 1515 Massachusetts Ave., N. W., Washington 5, D. C. Completed applications must be turned in by Jan. 19. The foundation will pay tuition, travel, and dependency allowances and $75 per week.

THE JOURNAL
OF THE
American Medical Association
Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 16
CHICAGO, ILLINOIS
DECEMBER 20, 1958
Copyright, 1958, by American Medical Association

NEUROSURGICAL CARE OF THE SEVERELY INJURED PATIENT

Guy L. Odom, M.D., Durham, N. C.

The frequency and gravity of injuries to the brain and spinal cord are such that they must be considered in the neurosurgical treatment of every seriously injured patient. It is necessary to recognize shock when it exists, for it must receive priority over everything else except when there is evidence of extradural hematoma. Shock is rarely caused by head injuries alone; its existence should immediately direct the examiner's attention to other parts of the body. The blood pressure, pulse rate, respiration rate, and temperature should be recorded every 15 minutes at first; at the same time the pupils should be observed as to size and reaction to light, and the state of consciousness must be determined. Extradural hematoma, if it occurs, requires immediate surgical intervention; if it is neglected, the results are either death or irremediable deficits. The immediate recognition of a spinal injury is of extreme importance in order to prevent further damage to the spinal cord. It is especially liable to be overlooked in the unconscious patient, and the transportation of such patients requires the greatest care. Surgery of compound depressed skull fractures can be delayed until the patient's vital signs are stable; and immediate laminectomy for spinal cord injuries is seldom required.

IT HAS BEEN estimated that injuries to the head occur in 72% of persons involved in automobile accidents and that 1 out of every 10 such injuries is dangerous or fatal.[1] These appalling figures indicate that the general practitioner and general surgeon must have adequate knowledge of handling the severely injured patient from a neurosurgical standpoint if the morbidity and mortality are to be reduced. The steady increase in the accident rate, despite the publicity of safety methods advocated by Shelden [2] and various organizations, indicates that the medical profession must continue to carry this gruesome burden.

It is impossible to adequately review all the problems encountered from a neurosurgical standpoint, and, therefore, I will confine my remarks to the decisions that must be made shortly after the patient is first seen and to treatment of acute emergencies.

Craniocerebral Injuries

It is frequently difficult to make a definite diagnosis or to completely evaluate a patient from a neurological standpoint immediately after an injury. In this complex situation one must, however, determine whether the patient is in shock, whether multiple injuries have occurred, whether there is evidence of increasing intracranial pressure, and whether there is evidence of spinal cord involvement.

The problems of shock and multiple injuries can be discussed together, because a severe head injury alone is seldom responsible for a state of shock.

From the Neurosurgical Division, Duke University Hospital and School of Medicine.

Read in the Panel Discussion on Management of the Severely Injured Patient before the General Scientific Meetings at the 107th Annual Meeting of the American Medical Association, San Francisco, June 23, 1958.

This should immediately direct the examiner's attention to the other organs of the body. Braunstein[1] reports that 44% of the patients with head injuries also have injuries to other parts of the body. The rupture of an abdominal organ or intrathoracic bleeding should always be considered in every patient with head injury who is in shock. The examination should also include a careful check of the extremities for long bone fractures to avoid fat emboli during movement. Multiple injuries of this type may be overlooked by the inexperienced examiner due to the fact that he becomes more concerned with the impairment in the patient's state of consciousness. The treatment of shock demands priority over everything else, unless it is obvious that the patient has an extradural hematoma. While the usual methods are being carried out to combat shock, the patient should not be moved for x-rays and scalp lacerations should not be sutured. The wound should be covered with sterile dressings and a tight elastic bandage applied. Most scalp bleeding can be controlled in this manner. In large arterial bleeders, the vessels may have to be clamped or ligated. If a fracture of an extremity is encountered, a temporary splint is applied.

Only after the patient's condition has stabilized can the necessary surgical procedures be carried out or the patient transported to another center.

The maintenance of an adequate airway is as essential as treating shock. The air passages may become obstructed by blood, mucus, and vomitus. This can be avoided by positioning the patient on his side with the head slightly lowered in order that dependent drainage may occur. At times suction is necessary, and, in patients with extensive faciomaxillary injuries, tracheotomy may be a lifesaving procedure. One should never hesitate to perform a tracheotomy in the unconscious patient who is having difficulty with respiration and is requiring frequent suction. Patients should not be transported unless someone is in constant attendance to prevent the aspiration of vomitus.

Observation and Treatment

After the first-aid procedures discussed above, if a closed head injury is present it may be necessary to observe the patient to determine whether the problem will be surgical or nonsurgical. The decision depends on whether the patient develops signs of increasing intracranial pressure.

The blood pressure, pulse rate, respiration rate, and temperature should be recorded every 15 minutes for one to two hours, then every 30 minutes, and finally every hour depending on the individual case. Elevation of the blood pressure, slowing of the pulse rate, rising temperature, and irregular respirations are indications of acute increased intracranial pressure.

Each time that the vital signs are recorded, the nurse should check the patient's state of consciousness. In the comatose patient, painful stimulation to the extremities should be used to determine whether there is less motor response on one side than the other.

The pupils are observed as to size and reaction to light each time the patient is checked. Unilateral dilation of the pupil followed by fixation is indicative of third nerve compression from herniation of the medial aspect of the temporal lobe over the edge of the tentorium. Bilateral constricted and fixed pupils and extensor rigidity of the extremities immediately after injury suggest mid-brain involvement and extremely poor prognosis.

If the patient is comatose, his position should be changed every two hours, an indwelling catheter should be used to avoid distention of the bladder and soiling the bed clothes, and he should be given fluids intravenously, 3,000 cc. daily (1,000 cc. of 5% glucose in saline solution and 2,000 cc. of 5% glucose in water), first for several days and then nasal feedings (electrolytes should be checked every two to three days). If the temperature becomes elevated, bed sheets and pajamas should be removed and an electric fan directed on the patient. Aspirin may be given by rectum, and, if necessary, cracked ice may be placed on a sheet over the patient. If patient is restless, 20-30 cc. of paraldehyde is given by rectum. Morphine should be avoided in all head injuries. Sodium phenobarbital, 60 mg. (1 grain), given intramuscularly every four to six hours is used to control convulsive seizures.

Extradural Hematoma

An extradural hematoma is one craniocerebral condition which requires immediate surgical intervention as soon as suspected if the patient's life is to be saved or marked residual neurological deficits prevented. Everyone who has had a transient episode of loss of consciousness should be observed for the first 12-24 hours with this possible diagnosis in mind. This is especially true if the accident occurs at night or if there has been an intake of alcohol. If the patient refuses hospitalization, a responsible relative or friend should be carefully instructed as to the situation and advised to rouse him every 30 minutes during the remainder of the night.

Extradural hemorrhages are caused by a linear fracture in the temporal region tearing the middle meningeal artery. The blow may have produced a short period of unconsciousness, but this is not so in every case. The hematoma with brain compression develops rather rapidly due to the arterial bleeder and sets up a chain of events which have already been discussed from the standpoint of increased intracranial pressure. The patient who has been clear mentally after an initial period of unconsciousness will become confused or semistuporous, his voluntary movements will become less pronounced on one side of the body, and his blood pressure will become elevated, with slowing of the pulse rate. It is at this stage that the diagnosis should be made and exploratory trephination performed. If the hematoma is not evacuated within a short period of time, coma will develop and the pupil on the involved side will become dilated and fixed to light from compression of the third nerve by a hippocampal herniation. If the patient has been permitted to reach this stage, immediate operation should be performed. There should be no delay for x-rays or even waiting for the patient's condition to stabilize if he is being treated for shock. The procedure is carried out with use of local anesthesia, and the usual methods can be continued to combat shock in the operating room. If a neurosurgeon is not available, the operation should be performed by a general surgeon. Valuable time will be lost in transporting the patient to another hospital, where he may be dead on arrival or irreversible damage to the brain stem may already have occurred. The later changes are due to the fact that the hippocampal herniation not only compresses the third nerve but also obstructs the spinal fluid pathway, which further increases the intracranial pressure. The herniation then enlarges with compression of the posterior cerebral artery, an infarction of the occipital lobe. Herniation of the opposite hippocampal gyrus will occur and both pupils become dilated and fixed to light. At this stage, brain stem involvement occurs with bilateral extensor rigidity of the extremities. The terminal phase of this sequence of events is hemorrhage into the brain stem. If a patient has developed bilateral dilated and fixed pupils, his prognosis is hopeless. The chances of survival even if the hematoma is evacuated and the herniation removed or tentorium split are nil.

It is always wiser to carry out exploratory trephination in the temporal region as soon as one suspects the possibility of an extradural hematoma by change in state of consciousness rather than to wait for evidence of a hippocampal herniation. Both temporal regions should be explored if the procedure is performed before localizing signs occur. If there are focal signs and a hematoma is not encountered on the suspected side, trephination should always be done on the opposite side. X-rays may be extremely helpful, if they have been obtained, by revealing a linear fracture crossing the middle meningeal groove or a shift of the pineal gland.

After evacuation of an extradural hematoma in the patient with third nerve palsy, the medial aspect of the base of the temporal lobe should be explored for a hippocampal herniation. If it has been present for a short period of time, it may be forced upward by injecting Ringer's solution into the spinal canal. If this fails, the herniation should be removed by suction or the medial edge of the tentorium should be split for a distance of 1.5 cm.

An acute subdural hematoma or extensive contusion and edema of the temporal lobe will produce a clinical picture which may be difficult to differentiate from that of an extradural hematoma. In the former, however, there is usually a history of a more severe injury and patient's state of consciousness is impaired from the time of the accident. Because of these possibilities, if an extradural hematoma is not encountered at the time of the exploratory trephination, the opening should be enlarged so that the subdural space and temporal lobe may be explored. At times, it is necessary to remove a portion of the contused temporal lobe because the softened edematous lobe may have herniated over the edge of the tentorium.

Compound linear and compound depressed fractures and penetrating wounds seldom require immediate surgical intervention, and operation can be delayed until the patient's vital signs are well stabilized and injuries to other parts of the body have been treated. Space does not permit a detailed description of the surgical procedures, but the following points must be stressed. The entire scalp should be clipped and shaved widely about the involved area; thorough cleansing and débridement of the scalp edges should be done; exposed linear fractures should be thoroughly inspected for hair and foreign material caught between edges of bone; and if foreign material is present the bone along both edges of the fracture line should be removed. In cases of compound depressed fractures, the bone fragments should be removed and cranioplasty performed at a later date. Depressed fractures over the large venous sinuses should not be elevated unless an exposure of the sinus on both sides of the fracture has been carried out in order that the bleeding from the sinus can be controlled if it has been torn. If the dura and cortex have been lacerated, a tight closure of the dura should always be obtained. In penetrating wounds, lumbar drainage of spinal fluid to decrease intracranial pressure is helpful in exploration of the missile tract.

Spinal Injuries

The immediate recognition of a spinal injury is of extreme importance in order to prevent further damage to the spinal cord. This is seldom a problem in the conscious patient, but it must be remembered that the unconscious patient may also have sustained an injury to the spine and spinal cord. In the comatose patient, the absence of deep reflexes in the lower extremities, diaphragmatic respirations, and the failure to obtain any reflex movement to painful stimulation in the lower portion of the body and to do so over the arms or shoulders indicates involvement of the spinal cord.

In all suspected spinal injuries, proper transportation is essential. This also applies to conscious, nonparalyzed patients who may complain of neck or back pain or numbness or pain in an extremity or extremities. More damage may be done to the cord by jackknifing the back or flexing the neck during transportation by an enthusiastic sympathizer than at the time of the original injury. The patient should not be lifted unless sufficient assistance is available to prevent flexion of the spine, and he should be placed on a firm, flat stretcher. Patients with injuries to the cervical spine do better on the back with sandbags or some other object along the side of the head and neck because of the diaphragmatic respirations. Those with lumbar or thoracic fractures may be placed on the abdomen.

As in head injuries, treatment of shock and maintenance of adequate airway assume prime importance. Intranasally administered oxygen should be used in all patients with cervical cord injuries, and, at times, immediate tracheotomy should be done if the injury is at the mid-cervical level. If the vital signs are stable, adequate x-rays should be obtained as soon as possible. In patients in whom cervical injury is suspected, the shoulders must be pulled down to obtain adequate exposure of the seventh cervical vertebra and views should also be taken of the odontoid process. The patient remains on the x-ray table while the films are being developed, and at this time he may be rolled on his side and a manometric examination carried out to determine whether there is a block in the subarachnoid space. As soon as the films are developed, a decision can be made as to the next step of relieving cord compression and reducing a fracture dislocation.

Cervical fracture dislocations can be reduced in a matter of hours by means of Crutchfield tongs with 20 to 40 lb. of traction. One should begin with 20 lb. and obtain periodic portable films to follow the reduction. The weights are gradually increased, depending on the case. After reduction, the patient is left in traction but the weights reduced to 10 to 15 lb.

In patients with cervical injuries who require immediate surgery of some other part of the body, tongs and traction should be applied before proceeding with the operation.

An indwelling catheter should be inserted shortly after admission and, if abdominal distention occurs, Miller-Abbott and rectal tubes should be used.

Laminectomy is seldom performed as an emergency procedure in closed injuries to the spinal cord and, in fact, may be an added unnecessary risk, especially in patients with injuries to the cervical cord. If a complete reduction cannot be accomplished by traction, an open reduction can be done a week or so later.

Fractures of the lumbar spine with involvement of the cauda equina present a different problem than fracture dislocations in the cervical and thoracic regions. If there are not other serious injuries, surgical decompression of the roots of the cauda equina will give a better prognosis.

In penetrating and gunshot wounds, operation is performed as soon as the patient's general condition will permit. The depressed bone fragments and foreign material are removed and the lacerated dura closed.

Summary

In care of the severely injured patient from a neurosurgical standpoint, one must determine first whether the patient is in shock, second, whether there are multiple injuries, third, whether there are signs of increasing intracranial pressure, and, fourth, whether there is evidence of spinal cord involvement. Shock must receive priority in treatment, except when there is evidence of an extradural hematoma. Maintenance of an adequate airway is important. Surgery of compound depressed fracture can be delayed until patient's vital signs are stable.

Attention must be paid to signs of spinal cord involvement in the unconscious patient. Further, the patient must be protected from additional cord damage during transportation. Spinal cord injuries seldom require immediate laminectomy.

References

1. Braunstein, P. W.: Medical Aspects of Automotive Crash Injury Research, J. A. M. A. **163**:249-255 (Jan. 26) 1957.

2. Shelden, C. H.: Prevention, Only Cure for Head Injuries Resulting from Automobile Accidents, J. A. M. A. **159**:981-986 (Nov. 5) 1955.

CARE OF THE PATIENT WITH MULTIPLE INJURIES

Otto E. Aufranc, M.D., Boston

There can be no rigid rules for the management of all extensively injured patients. The early recognition and management of important unsuspected lesions, however, will help to prevent additional superimposed trauma which, in itself, may make the difference between life and death or between mere survival and independence. The most important immediate problems consist of recognizing or establishing an adequate airway, preventing further hemorrhage, replacing blood, and avoiding damage by injudicious movement of the patient or his injuries.

Immediate Measures

We all know that the movement of the patient from the site of injury can itself be the actual cause of death. Transportation should be undertaken by trained persons, and those who do not know what to do should not do anything except try to get additional help. Transportation with the simplest type of side-splinting is probably the best. The control of hemorrhage by direct pressure compression bandages as opposed to a tourniquet is probably also best. Movement of the patient from the site of injury to the hospital should not be done with great speed but with great care and gentleness. Sudden starts and stops, bouncing over rough roads, and swerving around corners cannot do the injured patient any good.

Establishment of Extent of Injury.—The physician who first examines the patient should do a complete, rapid physical examination by a system, being sure in his own mind what he should look for. As with any physical examination, looking for the normal immediately reveals the abnormal. We should use all the senses we have been taught to use. We should look, we should feel, we should smell (alcohol, vomitus, feces, and urine acetone), we should listen, but, most of all, we should think.

A simple recording of the clinical findings is essential, since the clinical course of the patient and progressive changes of signs and symptoms are often the actual key to correct diagnosis. Recording of important negative findings which later change to positive makes a different prognosis. This is particularly true of intra-abdominal, head, and chest injuries.

Evidences of certain traumas are obvious to anyone. However, a more serious injury may be undetectable at the initial examination. Visceral injuries of this nature frequently manifest themselves hours after the initial trauma. They must be specifically suspected and specifically looked for in order for the physician to be ahead of their devastating possibilities if they are found out too late.

In dealing with an extensively injured patient, the most immediate problems consist of preventing asphyxia, stopping hemorrhage, replacing blood, and avoiding damage during transportation. The physician who first examines the patient must be systematic, and after the immediately evident problems have been dealt with the less obvious injuries must be considered. Fractures of extremities are overlooked in some cases; in others they hinder the physical examination and may divert the examiner's attention from serious spinal, intra-abdominal, or intrathoracic injuries. Sucking wounds of the chest, severe uncontrolled hemorrhage, and penetrating wounds of the abdomen require emergency operation. When combined abdominal and thoracic injuries are encountered, the thoracic portion is undertaken first. In many situations prompt action is more important than specialized knowledge, and such measures as clearing the airways by aspiration or tracheotomy, closure of open chest wounds, transfusion, splinting, or amputation may be lifesaving.

The orthopedist is taught to suspect a combination of injuries in certain types of trauma. For example, fractured patella and dislocation of the hip are often combined. The os calcis fracture is also often associated with a central dislocation of the hip or a fracture of the spine or of the base of the skull or both. A crushed pelvis is frequently combined with a rupture of the posterior urethra. Chest injuries are often associated with a ruptured spleen or a diaphragmatic hernia, and penetrating chest wounds may and often do involve abdominal viscera. These combinations must be thought of in order not to be overlooked.

Asphyxia, severe hemorrhage, and shock are common features in multiple injury cases, and immediate recognition and treatment are necessary. First, an open airway is essential to life and must be provided for at once. Simple manipulation of the tongue, mandible, or both or the change of position of the head and neck may be all that is necessary in the semiconscious or unconscious patient. Suction applied to or wiping out the upper airways

---

From the Department of Orthopedic Surgery, Harvard Medical School.
Read before the General Scientific Meeting at the 107th Annual Meeting of the American Medical Association, San Francisco, June 23, 1958.

may be sufficient to remove blood or mucus to establish a normal rate of respiratory exchange. At times, however, a tracheotomy must be resorted to as a lifesaving measure. It should be resorted to more frequently than the "wait and see" method when the patient seems to be in extreme condition. In those patients who do not have a cough reflex for clearing the upper passage, suction and administration of oxygen through a tracheotomy tube can be maintained with ease and infinitely more efficiently than by any other method.

Control of Hemorrhage.—Gross hemorrhage is the most common and often the simplest of all the conditions to alleviate. The application of local pressure, the use of the hemostat, and ties on grossly bleeding, pulsating vessels will control bleeding. However, pressure dressings carefully packed by the experienced surgeon are probably as efficient as any method of controlling hemorrhage. Such things as previously applied tourniquets and dressings should be removed so that the hemorrhage may be estimated and one can be more definitely sure that further loss of blood may not be a part of the maintenance of a shocked state. Concealed hemorrhage in the thorax, abdomen, or retroperitoneal space may cause death. In the severely injured patient, blood replacement therapy should be initiated at once and, while replacement of blood is being brought about, a more careful evaluation of the patient is easier and more surely apt to save his life—continued massive hemorrhage is not compatible with life for even a short duration of time.

The arrest of hemorrhage in the extremities probably deserves a specific note. Simple adequate elevation of the arm or leg often stops hemorrhage. In most cases arrest of hemorrhage might be better brought about by the use of a hemostat. However, the blind application of the hemostat to bleeding vessels is to be condemned, as the clamping in a sea of blood may well destroy arterial tissue that might not otherwise be destroyed and may preclude an otherwise reparable suture of a major vessel. Major nerve trunks usually accompany major arteries, and a previously damaged nerve may be permanently injured by blind clamping.

The use of a tourniquet when applied by an expert, of course, is invaluable. It requires precise application to arrest all arterial flow. Often tourniquets only obstruct the venous return and thus increase the bleeding. If the tourniquet has been applied and is adequate, it should be left in place until someone can adequately inspect the wound and determine the cause of the hemorrhage. At such a time when blood replacement is possible, several hours can elapse, if the extremity is kept cool, without really damaging the limb.

The amount of blood lost by a patient with a fractured thigh, for instance, may be excessive even though that might be the only injury. The blood loss may be excessive in relation to the loss from circulation. An increase in thigh measurement of 2 in. or more usually means that perhaps as much as 1,500 to 2,000 cc. of blood has been lost in that thigh. With musculoskeletal injuries o both legs and arms, for instance, as much as 3,000 to 4,000 cc. of blood might be lost to the circulation by the swelling and the hemorrhage around the fracture sites themselves.

As soon as an adequate airway has been established, hemorrhage arrested, and blood replacement started, the obvious fractures should b splinted to prevent further trauma and shock. Majo fractures, strangely enough, are commonly overlooked. Minor fractures and, frequently, dislocations of the major joints may go undetected. Fractures must be reduced and splinted not only to insure union and function but, mainly, to combat shock.

Shock.—Shock of some degree is associated with all multiple injuries. The main cause of shock is often loss of circulating blood volume. Replacement therapy, to be effective, must be prompt. It is best done by the use of whole blood, which increases circulating fluid volume, as well as the number of erythrocytes, to handle oxygen and carbon dioxide requirements in the tissues. Saline solution is invaluable as a temporary agent for raising the blood pressure only while awaiting plasma or whole blood. It should be only used in emergencies, because it leaves the circulation rapidly and takes plasma protein with it. Dextrose in water, as well as saline solution, is essential in treatment of shock.

Since it is important to allow prompt treatment of wounds which have caused the shock, it is essential to replace the missing blood before undertaking the management of the injury. This can usually be undertaken soon after the rise of blood pressure to over 80 mm. Hg with a fall of pulse rate and return of color and warmth to the skin. Blood replacement must be continued throughout the early surgical treatment as necessary. Trendelenburg position of the patient, elevation of the extremities, and the administration of oxygen are all useful adjuncts to the treatment.

Physical Examination.—Some of the diagnostic problems clarify themselves through the usual methods we have been taught, such as taking a good history and doing a careful physical examination. The knowledge of the mechanism of injury may give a real clue to concealed pathological changes. The obvious injuries must not divert the concentration of the careful examiner and thus allow him to overlook other things, such as serious spinal, intra-abdominal, or intrathoracic injuries. The fracture of an extremity and its obvious deformity often detracts from a careful physical examination. For instance, fractures of the extremity or bleeding from head lacerations often attracts attention to such a degree that frequently these are investigated too thoroughly by x-ray and other studies while the obvious but infinitely more important areas and serious internal injuries may go undetected. One must always guard against too many x-ray examinations when the general physical examination would have done just as well, if not better.

The physical examination must be quick, gentle, and without undue exposure. X-rays should be taken only when necessary and with minimum movement of the patient. It is possible that movement from a stretcher or table to an x-ray table will produce a profound circulatory collapse. It is much better to treat the patient as he is without x-rays rather than be forced to delay urgent therapy because of more shock induced by the performance of an x-ray examination. Roentgenograms for essential diagnosis and correct management can be more safely taken in the emergency room without moving the patient.

Initial Management of Specific Types of Injury

Immediate first-aid measures include control of asphyxia and hemorrhage, management of shock, and temporary splinting of fractures. The surgeon must then focus his attention on specific injuries and treat them with priority in regard to immediate and ultimate management. A decision must be made as to what operative procedure should be undertaken and when. Obviously, sucking wounds of the chest, severe uncontrolled hemorrhage, and penetrating wounds of the abdomen require emergency operation. It is essential to remember that an appreciable number of patients will require formal surgical measures as an integral part of their resuscitation.

Chest injuries require priority in treatment of any serious disturbance of the cardiovascular physiology. Potential bronchial secretions, sucking wounds, pneumothorax, massive bleeding into the pleura, and cardiac tamponade all may lead to profound cardiorespiratory changes requiring immediate treatment. Thoracic injuries should be treated before other operative procedures are undertaken, and when combined abdominal-thoracic injuries are encountered, the thoracic portion is undertaken first.

Crushing injuries of the chest associated with multiple rib fractures and paradox movement of the portion of the thoracic cage present a particularly difficult problem because of the serious derangement of cardiorespiratory physiology. Tracheotomy is particularly valuable in such patients. Paravertebral block and local infiltration to control pain are effective in the maintenance of an adequate oxygen exchange.

Abdominal Injuries.—Blunt and penetrating types of trauma produce many lesions in the abdomen. A careful local examination of the abdomen must be undertaken, particularly in an unconscious patient. All penetrating wounds of the abdomen should be explored as soon as the general condition permits. Watchful waiting is dangerous. Blunt injuries are a little more difficult but are, nevertheless, serious. Ruptured spleen, bladder, lacerations of the liver and intestine, mesenteric hemorrhage, and other injuries to the pancreas all present diagnostic difficulties as a result of blows in the lower part of the chest or the abdominal wall. Lacerations of the kidneys and serious retroperitoneal hemorrhage may be associated with injuries to the spine.

Urologic Wounds.—Urine specimens must be obtained promptly in all seriously injured patients. The presence of blood indicates some injury; however, the degree of hematuria is not necessarily indicative of the degree of damage. Most urinary injuries can be treated conservatively, but rupture of the ureter, bladder, and urethra require early initial repair to prevent urine extravasation.

Neurological Damage.—Peripheral nerve function should be determined in the examination of any wound of the extremities. Simple tests for detection of nerve injuries in both the upper and lower extremities are well known, and detection is relatively easy. The discovery of a peripheral nerve lesion after manipulation is disturbing and requires immediate reinvestigation.

The state of consciousness frequently alters the extent and interpretation of the complete examination. It masks symptoms of serious injury and causes delay in the management of injuries otherwise easy to care for.

Orthopedic Problems.—Most traumatic lesions alone do not present a serious therapeutic problem, but, when encountered in combination with other things, they create a major surgical problem. An open reduction may be advisable when it is the only injury, but in multiple injuries it may be contraindicated. Débridement of open wounds, reduction and immobilization of fractures, early amputation of all devitalized parts, and other procedures all play a major part in the rehabilitation of the extensively injured patient. Early grafting or suturing of major blood vessels by those specialized in the field may be much more important as the immediate operation than fixing the fracture properly.

The prevention of infection should not be left out of an orthopedic surgeon's thoughts in managing his injured patient. The use of a broad-spectrum antibiotic and whole blood, débridement of devitalized tissue, and the use of prophylactic antitetanic serum and toxoid therapy are all essential.

Summary

In management of a patient with multiple injuries, efforts should be directed first toward relieving the causes of asphyxia and then to treatment of sucking chest wounds, maintenance of a free airway, arrest of hemorrhage and replacement of blood, splinting of fracture, and, finally, débridement of the contaminated wounds. During the time a patient is unconscious on a stretcher, no harm can come from carefully and simply splinting all extremities. Every physician who treats severely injured patients must be prepared to institute emergency lifesaving measures in any part of the body. He may not do as well as the specialist, but he can often do a tracheotomy and aspirate mucus and blood from the nose and throat, stop sucking chest wounds, give intravenous fluids and blood, and adequately splint badly mangled extremities.

The judicious performance of amputation of a badly mangled extremity can also make the difference between returning a patient soon after injury to an active useful life and condemning him to prolonged invalidism.

266 Beacon St.

MANAGEMENT OF THE SEVERELY INJURED PATIENT—GENITOURINARY ASPECTS

John W. Schulte, M.D., San Francisco

A carefully considered, systematic, orderly approach is essential when one is dealing with possible injury to the genitourinary tract. Three fundamental steps are involved: history of injury, physical findings, and laboratory studies.

History of injury, physical findings, and laboratory studies are the three fundamental steps in the diagnosis of any urologic injury. To limit one's field of vision to just the possibility of a ruptured bladder would be shortsighted when the patient's immediate problem is anoxia and paradoxial breathing due to a crushed chest. The prognosis of anterior and posterior urethral trauma must be a guarded one. Dense strictures may result from these injuries, requiring periodic urethral dilatation for months or years. Immediate surgical treatment is indicated in rupture of the bladder after the patient has been suitably prepared. Shock must be treated first by whatever method is most appropriate. The common cause of ruptured kidney is a direct blow to the loin over the region of the 11th and 12th ribs. Follow-up observations should be made on patients who have sustained a ruptured kidney. A kidney may be injured sufficiently to cause its ultimate death, yet not sufficiently to warrant immediate operation. Such damage may be found only by repeat studies several months later.

Fundamental Steps in Diagnosis

History.—A careful history is all important. If the patient is unconscious, or unable to give an accurate account of his injury, a witness to the accident should be questioned.

Different varieties of trauma can be expected to cause specific lesions in the genitourinary tract. For example, a person working on a roof who falls astride a scaffold is most likely to rupture the bulb of the urethra. Someone who suffers a severe blow directly over a distended bladder is likely to suffer an intraperitoneal rupture of the bladder; a person who sustains a compression fracture of the pelvis is apt to have an extraperitoneal rupture. A blow over the angles of the 11th and 12th ribs is more likely to cause a ruptured kidney than ruptured urethra.

Physical Findings.—A thorough physical examination is mandatory and should include a rectal examination. To limit one's field of vision to just the possibility of a ruptured bladder would be shortsighted when the patient's immediate problem is anoxia and paradoxial breathing due to a crushed chest.

Rectal examination may demonstrate that the prostate gland lies in the middle of the pelvis rather than its normal position, which suggests complete rupture of the prostatomembranous urethra.

Laboratory Studies.—Laboratory studies are dictated by the patient's needs and should include blood cell count and hematocrit value determination, urinary studies with microscopic examination of the urinary sediment, and roentgenograms for skeletal and soft tissue injuries. Special roentgeno-

---

From the Department of Surgery (Urology), University of California School of Medicine.

Read in the Panel Discussion on Management of the Severely Injured Patient before the General Scientific Meeting at the 107th Annual Meeting of the American Medical Association, San Francisco, June 23, 1958.

graphic examinations, such as the excretory urogram, retrograde cystogram, and urethrogram, are indispensable aids to diagnosis.

This discussion will be limited to diagnosis and treatment of the common types of genitourinary injuries—ruptures of the urethra, bladder, and kidney.

Ruptured Urethra

Ruptures of the urethra may be divided into two groups: (1) those occurring distal to the triangular ligament and (2) those proximal to it. The latter are further subdivided for purposes of treatment into complete and incomplete ruptures.

Anterior Urethral Injuries.—Ruptures distal to the triangular ligament are caused by direct, external trauma and usually occur at or near the bulb of urethra. A common type is the so-called straddle injury.

A blow to the perineum followed by bleeding from the urethral meatus, initial hematuria, or inability to void is the common history. If the rupture has been complete and the patient attempts to urinate, he may complain of pain and sudden increased swelling of the perineum and scrotum. These symptoms indicate urinary extravasation.

The most important positive physical finding associated with rupture of the anterior urethra is blood at the urethral meatus. Further examination reveals ecchymosis and edema of the scrotum and perineum. If urinary extravasation has occurred, the tissues are tense and distended from the urogenital perineum forward and edema may extend upward into the subcutaneous tissues of the anterior abdominal wall. Rectal examination demonstrates the prostate to be in normal position. If the patient has urinary extravasation, he may be acutely ill; rapid pulse and hypotension may be noted. In the absence of urinary extravasation, the patient, while complaining of pain, does not appear particularly ill.

A roentgenogram of the pelvis should be obtained to determine skeletal injury. This accomplished, the patient remains on the x-ray table and urologic studies are done. An urethrogram is obtained first. My practice is to mix K-Y lubricating jelly (containing boric acid, glycerol, chondrus, and tragacanth) with an equal part of a 25% methiodal (Skiodan) sodium solution for contrast medium; the mixture is gently instilled into the urethra with a bulb syringe, and anteroposterior and oblique roentgenograms are made. From these studies the site and degree of injury can be determined.

If the roentgenographic studies demonstrate an incomplete rupture, an attempt is made to pass an urethral catheter into the bladder. If this is successful, the catheter is left indwelling for three to five weeks.

If the films show a complete urethral rupture, or if a catheter cannot be inserted past the area of incomplete tear, immediate surgical treatment is indicated. The type of operation undertaken depends on the skill and training of the surgeon.

If there is any question in the surgeon's mind concerning his ability to deal with such a problem directly, the simplest and most expedient operation to perform is a suprapubic cystostomy. This procedure diverts the urine and obviates the possibility of urinary extravasation. Secondary repair of the urethral injury can be done later. If the surgeon feels capable of attempting primary repair, he should proceed at once.

If subcutaneous urinary extravasation has occurred at the time of or subsequent to the injury, adequate drainage of perineum and scrotum should be established. The urethra is a contaminated field, and organisms washed into the surrounding tissues by urine grow luxuriantly; a rapidly progressing phlegmonous type of infection may ensue which may soon be fatal.

Posterior Urethral Injuries.—Rupture of the prostatomembranous urethra results from a shearing type of force and is most often associated with severe trauma to the bony pelvis.

The history is usually of a direct blow to the pelvis, such as may occur in heavy industry or an automobile-pedestrian accident.

Positive urologic history consists of the patient being unable to void or having voided a small amount of grossly bloody urine. Abdominal pain is not specific because of the usually associated pelvic, skeletal injury.

In regard to physical findings, the presence of purplish discoloration above the symphysis pubis, with associated lower abdominal tenderness and spasm, suggests possible rupture of the posterior urethra. The most important physical finding is obtained from rectal examination. If there is complete division of the prostatomembranous urethra, the prostate will be felt to be high in the pelvis rather than in its normal position. Because of extravasation of blood and urine in incomplete rupture, the boundaries of the prostate may be indefinite.

Since such patients usually have multiple injuries and may be critically ill, they should be disturbed as little as possible; all ancillary diagnostic studies should be made at one time as soon as the patient's condition permits.

When the history and physical findings suggest rupture of the posterior urethra, an urethrogram made as previously described will demonstrate the site and extent of injury. An incomplete rupture will allow some of the contrast medium to enter the bladder and some to be extravasated. A complete rupture allows most of the contrast medium to extravasate around the bladder and prostate; the latter is seen to be elevated in the pelvis.

An alternative procedure is to pass an urethral catheter and perform retrograde cystography, with use of a 25% solution of methiodal. This is the usual method, since it may be difficult to determine by history and physical findings alone whether the bladder or posterior urethra is ruptured. When retrograde cystography is used, the catheter may be seen to lie outside the bladder in complete rupture of the urethra with perivesical extravasation of contrast medium. In incomplete rupture, the bladder may be seen to be elongated and compressed by perivesical collection of blood and urine with a leak at the site of injury.

In treatment, urethral continuity is reestablished and the pelvic retroperitoneum is drained. The technique used depends on the surgeon's judgment.

Prognosis.—The prognosis of anterior and posterior urethral trauma must be a guarded one. Dense strictures may result from these injuries, requiring periodic urethral dilatation for months or years. Loss of sexual potency, particularly with posterior urethral injuries, is common and may be permanent.

Ruptured Bladder

Rupture of the bladder is either intraperitoneal or extraperitoneal. The history of injury gives an important clue as to which form of rupture may be present.

Intraperitoneal Rupture.—A direct blow over the suprapubic area is most likely to cause an intraperitoneal rupture of the bladder. This is particularly true if the patient has a full bladder at the time of injury. Trauma is followed by severe suprapubic and lower abdominal pain and passage of bloody or smoky urine.

These patients may be in shock. The abdomen is tense, particularly in the lower quadrants, and board-like rigidity may be noted immediately after injury. Peristalsis is absent or hypoactive. Rectal examination may define a fluctuant area in the region of the cul-de-sac.

Laboratory findings reveal the urine to be usually grossly bloody or smoky. It occasionally may appear relatively clear, but microscopic hematuria is always present.

Retrograde cystography is diagnostic. Three films are made: a preliminary roentgenogram, a film with the bladder distended with a 25% solution of methiodal, and one after the bladder has been evacuated. It is important that the bladder be filled to capacity; a small tear may be sealed immediately by omentum and so not be visible otherwise on the roentgenogram.

The postevacuation roentgenogram is particularly important, because it shows contrast medium extravasated into the peritoneal cavity or pooled in the cul-de-sac.

Extraperitoneal Rupture.—The extraperitoneal rupture is most often associated with fractures of the pelvis and results from indirect trauma to the bladder.

The history is almost identical to that obtained in the intraperitoneal rupture, except for the type of trauma. A crushing type of pelvic injury is the usual story.

Physical findings are usually similar to those seen in patients with intraperitoneal rupture, with few exceptions. Among these are more localization of pain and spasm to the lower quadrants, a bluish discoloration of the suprapubic skin, and normal rectal findings.

Urinary studies also will give results similar to those found in patients with intraperitoneal rupture. Plain roentgenograms usually show deformities of the pelvic skeleton, varying from multiple fractures to separation of the symphysis pubis or sacroiliac joints.

Retrograde cystography done in the same manner as in intraperitoneal rupture shows perivesical extravasation of radiopaque fluid in the evacuation roentgenogram.

Treatment.—Immediate surgical treatment is indicated in both types of rupture of the bladder after the patient has been suitably prepared. Shock must be treated first by whatever method is most appropriate. Other injuries, if more pressing, are treated before urologic surgical repair is undertaken.

In both intraperitoneal and extraperitoneal ruptures of the bladder, abdominal exploration is mandatory. It is imperative that the peritoneal cavity be opened and the pelvic viscera, including small intestine and rectum, be examined; a force strong enough to cause rupture of the urinary bladder may also cause severe injury to adjacent organs. Injuries to other organs are treated first.

Treatment of intraperitoneal rupture of the bladder consists of mobilization of the rent in the peritoneum from the surface of the bladder, closure of the bladder mucosa and muscle, and reapproximation of the peritoneum. After this, urinary drainage is established suprapubically by means of cystostomy. Dependence on an indwelling urethral catheter alone is not recommended, since the lumen may become occluded, the bladder may become distended, and a leak may occur at the site of repair.

Treatment of extraperitoneal rupture of the bladder again consists first in exploration of the peritoneal cavity. If no associated lesions are present, the peritoneum is closed and the bladder is exposed extraperitoneally, the prevesical space being widely opened on either side. This permits drainage of the extravasated urine and blood. The bladder is then entered suprapubically, and a cystostomy drain is inserted. No attempt is made to identify the site of rupture unless it easily comes to view. Experience has shown that lacerations of the bladder will heal without suture if the bladder is put at rest by cystostomy drainage.

The prevesical space is drained for 10 days, at which time cystotomy tube and drains may be removed and the cystotomy allowed to close spontaneously or encouraged by means of urethral catheter drainage.

Ruptured Kidney

Because of its anatomic position and coverings, the kidney is not prone to injury. There are, however, predisposing causes for rupture of the kidney, the most common of which is hydronephrosis. The common cause of ruptured kidney is a direct blow to the loin over the region of the 11th and 12th ribs.

History and Findings.—The pertinent history is of a direct blow to the loin followed by pain in the affected side and the passage of grossly bloody urine, sometimes with blood clots. The pain is severe and may radiate anteriorly into the abdomen or groin.

The patient may appear acutely ill, pale, and perspiring and have rapid pulse and hypotension. Local physical findings demonstrate spasm of the flank musculature on the injured side with reflex guarding and spasm on the abdominal muscles. An area of ecchymosis may be noted over the loin.

On careful examination a mass in the flank may be felt. If a mass is found, its margins should be marked with ink on the patient's skin for future reference. If the urinary collecting system has been damaged, cutaneous edema may be seen over the area of the lumbar triangle from extravasation of urine.

The urinary specimen is almost always grossly bloody, and red blood cells are always seen microscopically.

A roentgenogram of the abdomen may show injury to the skeleton, including fractures of the ribs or transverse processes. Of diagnostic value is the absence of a psoas shadow on the affected side and the absence or haziness of renal outline.

The most useful diagnostic study used in proving ruptured kidney is the excretory urogram. Contrary to the beliefs of some, excellent studies of the upper and midurinary tracts may be obtained without the usual preliminaries of dehydration and catharsis.

Excretory urograms in the case of a presumably ruptured kidney should be done to obtain the following information: 1. The size, structure, and function of the unaffected kidney. A congenital, solitary kidney is not an uncommon anomaly, and congenital hypoplasia is not rare. It is obvious that a contemplated nephrectomy in the case of renal rupture must be predicated on the presence of a life-sustaining remaining kidney. 2. The degree of injury to the kidney itself. If there has been complete transection of the renal pedicle, contrast medium will not concentrate in the kidney. If the renal substance has been lacerated, intrarenal extravasation will be seen. 3. Injury to the collecting system. If the pelvis or ureter has been torn, extrarenal extravasation will be apparent.

Treatment.—Treatment is initially directed for the patient as a whole. He must be relieved of pain and given such supportive therapy as is necessary to overcome shock if present. Ninety per cent of patients with ruptured kidney require supportive therapy only. The type of operation in the remaining 10% depends on the type and severity of the injury. Surgical intervention should not be considered as long as the patient's general condition improves with supportive treatment. Ominous signs include continued shock in spite of supportive measures or increasing size of a mass in the flank, as demonstrated by repeated physical examination. Either indicates continuing hemorrhage.

If the patient continues to be in shock in spite of transfusion and ancillary treatment, immediate operation is indicated as a lifesaving measure. In my experience with such patients, either the kidney is completely shattered or its vascular pedicle is completely transected. Under these circumstances nephrectomy is usually the operation of choice, depending, of course, on the presence of a second, life-sustaining kidney.

Urinary extravasation demonstrated by excretory urography demands surgical drainage, but this is not urgent and can be done when the patient has recovered from the initial effects of injury. Drainage can easily be established by introducing a Penrose drain through Petit's triangle deep to Gerota's capsule.

Follow-up observations should be made on patients who have sustained a ruptured kidney. A kidney may be injured sufficiently to cause its ultimate death yet not sufficiently to warrant immediate operation. Such damage may be found only by repeat studies several months later.

384 Post St.

ANILERIDINE HYDROCHLORIDE—ITS CLINICAL USE AS AN ANALGESIC AND SEDATIVE

PRELIMINARY REPORT

Robert C. Therien, M.D., Leroy W. Lee, M.D., Edward M. Malashock, M.D.
and
Neal B. Davis, M.D., Omaha

The clinical effects of anileridine hydrochloride have been observed after more than 2,500 administrations to more than 600 patients. It was used both as premedication for general anesthesia in surgery (in doses averaging 50 mg. orally or subcutaneously) and as a postoperative sedative and analgesic (in doses ranging from 25 to 75 mg.). Its effects resemble those of morphine and meperidine, but euphoria was uncommon, and no evidence of addiction was seen even in a patient who received 552 doses during the course of metastatic carcinoma of the colon. In patients who received the drug daily for various periods of time, there was no evidence of withdrawal symptoms when a series of administrations was interrupted. Nausea occurred in eight and emesis in six instances. Respiratory depression caused by excessive doses in a few patients was easily counteracted by levallorphan in doses of 1 mg. for every 25 mg. of anileridine hydrochloride. It was effective in the very old as well as the very young and showed promise of usefulness in a wide diversity of medical and surgical situations.

Anileridine hydrochloride is a substituted meperidine which is chemically known as ethyl-1-(4-aminophenethyl)-4-phenylisonipecotate dihydrochloride. The structure is shown in the figure. Experimental observations in animals and man have proved it to be a potent analgesic agent with high activity and relatively mild side-effects when given orally. In animals, the compound approaches the analgesic potency of morphine and is more potent than meperidine. It has a prompt onset of action (15 to 30 minutes) and a long duration of analgesia (five to six hours). The side-reactions, such as general depression, depression of respiration, and lowering of blood pressure, are considerably milder than those produced by morphine and somewhat milder than those of meperidine.

Synthesis of the compound was accomplished in 1956 by Weijlard and co-workers.[1] Pharmacological characteristics of anileridine were studied by Orahovats and associates,[2] who found aside from the characteristics already enumerated that the compound had an antitussive effect, an anticholinergic effect, and an antihistaminic effect. It did not produce constipation, as was seen with morphine. It was well tolerated by mice, rats, cats, and dogs in single and repeated administrations. Tolerance to the analgesic effect developed slower for anileridine than for either morphine or meperidine. Local tissue injection with 50 mg. of anileridine produced considerably less reaction than similar solutions of meperidine. The effects of anileridine were reversed by nalorphine (Nalline) hydrochloride.

Porter[3] described the absorption and metabolism of anileridine and suggested analytical methods for identifying anileridine in the tissues and body fluids. He stated that the metabolism and excretion of anileridine are similar to those of meperidine. The highest concentrations of anileridine were found in the lungs, kidneys, and brain. Major excretion was by way of the kidneys.

Observations on the effects of anileridine in man have been reported by Keats and co-workers,[4] Dripps and co-workers,[5] Wallenstein and Houde,[6] and Stage.[7]

Observations on Drug Usage and Effect

Our observations were begun shortly after the compound was synthesized in 1956 and proved to be suitable for administration to animals and man, and they have continued to this time. During this time we have given anileridine to over 600 patients. We have used various preparations of the drug and various methods of administration. These preparations have included tablet and elixir for oral administration, as well as solution for intramuscular, subcutaneous, and intravenous use. The drug was used for preoperative analgesia and sedation, as well as for postoperative analgesia. Observations for preoperative sedation were made personally by us. The postoperative analgesic effectiveness and durations were observed by special and regular duty nurses. These in turn were reported to the house staff physicians for evaluation. Patients with ad-

---

From the departments of anesthesiology and urology, Bishop Clarkson Memorial Hospital, and the University of Nebraska College of Medicine.

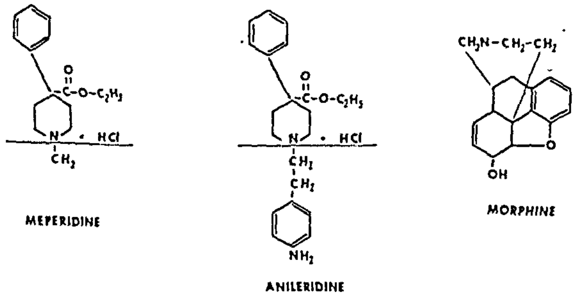
Read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

vanced painful carcinoma, as well as those with other painful clinical conditions, were observed for its analgesic effect.

In the entire study, anileridine was administered over 1,900 times. For preoperative medication it was given alone in 260 instances, with orally given vinbarbital (Delvinal) sodium, 100 mg., 302 times, and with atropine or scopolamine hydrobromide 70 times—making a total of 632 preoperative administrations. Doses varied from 25 to 100 mg., but the average subcutaneous and oral dose was 50 mg. For postoperative sedation and analgesia, anileridine was given 1,320 times. The dose ranged from 25 to 100 mg. The average doses were 50 to 75 mg.

In this series of 632 patients coming to surgery and receiving anileridine preoperatively, regional anesthetics were used in 562 and general anesthetics in 70 instances. The types of surgical procedures were as follows: cystoscopy (71), cystoscopy, ureteral catheterization, or manipulation (321), renal operations (24), ureteral operations (23), perineal prostatectomy (38), transurethral prostatectomy (61), suprapubic prostatectomy (4), suprapubic vesical operation (11), transurethral resection of bladder tumor (22), scrotal operation (70), bilateral adrenalectomy, retroperitoneal tumor (3), urethral or penile operation (23), presacral oxygen study (4), breast biopsy (2), and gynecologic surgery (59).

Inasmuch as several of these patients had two separate surgical procedures performed during the same hospitalization, it offered a novel way to observe the comparative effect of meperidine and anileridine preoperatively in the same patient. A group of 50 patients were given anileridine subcutaneously with orally given vinbarbital sodium on one occasion, and an equal dose of meperidine was substituted for anileridine on another. All medication in this series was given one hour preoperatively. Since the operative procedure in these patients was done with use of regional anesthesia, it was possible to observe them very accurately in the operating room and recovery room for a minimum of two hours. It was found that, in this series, 50 mg. of anileridine was as effective as 75 mg. of meperidine for comparable signs of analgesia and sedation.



Structural formulas for meperidine, anileridine, and morphine.

In patients receiving anileridine, the onset of analgesia appeared in 15 to 30 minutes and was profound at 60 minutes. The analgesic effect of anileridine appeared to last for one to seven hours, with an average of three to four hours. These observations were made with average dosages of 50 to 75 mg. No deaths or severe toxic reactions were seen incident to administration of anileridine. Overdoses in a very few patients were manifested by respiratory depression. The respiratory depression was easily counteracted by administration of levallorphan in a ratio of 25:1 for the unanesthetized patient. When intravenously given barbiturates were used with a general anesthetic, the antagonist dose was doubled, i. e., 12.5 mg. of anileridine was counteracted by 1.0 mg. of levallorphan.

Table 1.—*Case and Dosage Data in Patients Receiving Anileridine*

			Dosage Data		
Case, No.	Sex	Age, Yr.	No.	Size, Mg.	Interval, Days
1	F	74	66	50	20
2	F	21	35	50	9
3	M	70	31	25	21
4	F	22	28	50	8
5	M	74	23	50	15
6	M	59	27	75	30
7	M	33	47		8, 9*

* Patient received 23 doses in eight-day period and, on second admission two months later, 24 doses in nine-day period for second operative procedure.

Untoward effects observed were as follows: nausea (eight), emesis (six), vertigo (two), headache (two), sensation of choking (one), itching (one), and deep sedation (three). The latter effect occurred in patients receiving 75 mg., 100 mg., and 100 mg. respectively. No evidence of abdominal cramps or constipation was seen. Neither evidence of toxic psychotic effects nor severe circulatory depression was seen. Euphoria was uncommon.

Special Uses and Addiction

Special Uses.—Observations on special uses of anileridine were made as follows. In children, anileridine used both preoperatively and postoperatively appeared to be effective and well tolerated. The dosage given was one-half the standard accepted meperidine dosage for age and weight. The pain of ureteral colic, urinary and gallbladder spasm, and coronary thrombosis, peripheral vascular pain, and pain of metastatic carcinoma was relieved. In the geriatric age group, anileridine was effective preoperatively and postoperatively, as well as in other painful conditions. There were 170 patients over 80 years of age in this group. It did not produce the psychic disorientation so often seen with morphine when used in aged persons. The large percentage of geriatric-patient surgical procedures done is shown in the previous section. In the series were 12 severe diabetic patients and 5 with severe asthma. In both groups, the severe disease was not aggravated and the drug appeared to be well tolerated. Dripps and associates[5] have demonstrated the antihistaminic effect of anileridine in man. The severe tremor of Parkinsonism was noted to disappear in two patients after administration of anileridine.

Addiction.—We have found anileridine to produce no evidence of addiction. Our series includes several patients who received a considerable number of repeated doses with subsequent easy withdrawal of the drug. Table 1 shows dosage regimen of our patients receiving the drug hypodermically in multiple doses.

Orally, for metastatic disease, four patients received repeated doses as shown in table 2. In the patient in case 2 (table 2), medication was withheld 10 days during the middle of the series without evidence of withdrawal symptoms. A total of 105 patients received oral medication with anileridine. In all, this medication was well tolerated.

TABLE 2.—*Case and Dosage Data in Patients Receiving Anileridine for Metastatic Disease*

		Dosage Data		
Case, No.	Carcinoma of	No.	Size, Mg.	Interval, Days
1	Kidney	66	25-50	20
2	Bladder	100	25-50	30
3	Bladder	232	25-50	120
4	Colon	552	25-50	128

The oral route of medication for drugs is considered much less likely to cause addiction. The hypodermic route, for psychological reasons, is considered more likely to cause addiction in the person requiring continual narcotic medication. According to some psychiatrists,[8] the hypodermic route provides a symbolic-accentuation of the importance of the medicine. For this reason, anileridine with its high oral effectiveness can be considered a very useful addition to the group of orally effective drugs used for the relief of pain.

Summary

The clinical use of anileridine as a preoperative and postoperative analgesic and sedative was observed in a study of over 600 patients. This study showed anileridine to be a valuable addition to the present group of analgesic-sedative agents. It is effective given orally and parenterally, with a minimal amount of undesirable side-effects. Anileridine was found to be effective and well tolerated by children, as well as by patients of advanced age.

Further observations should be continued of the effects of anileridine in the management of patients with severely painful clinical conditions, such as ureteral colic, biliary colic, embolism, and coronary thrombosis. Its effects on patients with diabetes, asthma, and Parkinsonism should also be observed further.

Addendum

Since the completion of this study series, an additional 653 doses of anileridine have been administered, without any remarkable change from our previous study's statistics.

800 Doctor's Bldg. (Dr. Therien).

The anileridine used in this study was supplied as Leritine by Merck Sharp & Dohme Division of Merck & Co., Inc., Philadelphia.

References

1. Weijlard, J., and others: New Synthetic Analgesic, J. Am. Chem. Soc. **78**:2342-2343 (May 20) 1956.

2. Orahovats, P. D.; Lehman, E. G.; and Chapin, E. W.: Pharmacology of Ethyl-1-(4-Aminophenethyl)-4-Phenylisonipecotate, Anileridine, New Potent Synthetic Analgesic, J. Pharmacol. & Exper. Therap. **119**:26-34 (Jan.) 1957.

3. Porter, C. C.: Absorption and Metabolism of Anileridine, Ethyl-1-(4-Aminophenethyl)-4-Phenylisonipecotate, J. Pharmacol. & Exper. Therap. **120**:447-451 (Aug.) 1957.

4. Keats, A. S.; Telford, J.; and Kurosu, Y.: Studies of Analgesic Drugs: Anileridine Dihydrochloride, Anesthesiology **18**:690-697 (Sept.-Oct.) 1957.

5. Dripps, R. D.; Millar, R. A.; and Kneale, D. H.: Comparison of Anileridine, Morphine and Meperidine in Man, Surg. Gynec. & Obst. **105**:322-326 (Sept.) 1957.

6. Wallenstein, S. L., and Houde, R. W.: Clinical Evaluation of Relative Analgesic Potencies of Anileridine, Meperidine and Morphine, abstracted, J. Pharmacol. & Exper. Therap. **122**:81 (Jan.) 1958.

7. Stage, J. T.: Anileridine as Anesthetic Agent, J. Florida M. A. **44**:143-145 (Aug.) 1957.

8. Faucett, R. L.: Drug Addiction and Other Considerations in Management of Pain with Narcotic Drugs, Proc. Staff Meet. Mayo Clin. **32**:45-54 (Feb. 6) 1957.

ROENTGENOLOGIC EVIDENCE OF FETAL DEATH.—At roentgen examination of relatively mature fetuses before delivery, a zone of reduced density is usually discovered around the head of the fetus, produced by the subcutaneous layer of fat. If the fetus is dead, this transparent zone in certain cases is separated from the cranium by a layer of the same density as the other soft tissues of the fetus. This finding was described for the first time by Deuel in 1947 as a sign of intrauterine fetal death. Intrauterine fetal death can be determined in the majority of cases (more than 75 per cent) by means of a roentgenologic examination. Free gas is the most common and the most important sign of fetal death. In cases where the death of the fetus occurs when the fetus is almost at term, free gas and Deuel's halo sign are frequently noted, whereas when the fetus dies in an early stage of development, the most common roentgenologic sign of death is the maceration of the trunk. —O. F. Holm, Deuel's Halo Sign, *The American Journal of Roentgenology,* October, 1958.

THE PROBLEM OF CARDIAC ARREST

Kenneth C. McCarthy, M.D., Toledo, Ohio

Cardiac arrest is best defined as sudden cessation of cardiac function from the effects of anesthesia or surgical manipulation. The incidence of cardiac arrest has been recorded as anywhere from 1 per 696 to 1 per 24,000 operations. The natural tendency to evade responsibility by reporting deaths due to anesthesia as due to cardiac arrest must not be overlooked. The patient should be protected against noxious reflexes by proper and adequate premedication. Hypoventilation with its vicious offspring, hypoxia and hypercapnia, must be avoided. All exponents of the art of anesthesiology must be diligent and conscientious in preventing this tragedy.

The Chairman of the Section on Anesthesiology traditionally reviews the growth of the specialty from the date of Adam's historic thoracoplasty. Recent advances in research and technique may be viewed proudly, and certain innovations may be regarded as radical and therefore dangerous practices. However, a new day is certainly dawning; we are on the threshold of a new and glorious era in anesthesiology.

I am also in the happy position of knowing that this paper will have an assured if not attentive audience. This is too good a chance to pass up, and it gives an opportunity to discuss a problem that is assuming increasing importance in anesthesia and surgery. This subject is cardiac arrest.

This topic is attracting more and more interest. A superficial review of the literature shows six times as many papers published in the last 5 years as in the previous 50. Most of these authors believe that the incidence is increasing, but no one agrees as to what this incidence actually is. Some typical figures are as follows: Natof and Sadove[1] record the incidence of cardiac arrest as 1 per 696 operations, Lahey and Ruzicka[2] as 1 per 1,000, Hingson and co-workers[3] as 1 per 1,078, Briggs and associates[4] as 1 per 1,400, Jacoby and associates[5] as 1 per 1,588, Bergner[6] as 1 per 2,000, Johnson and Kirby[7] as 1 per 3,600, Bonica[8] as 1 per 4,150, Merritt and Osterhagen[9] as 1 per 8,600, and Blades[10] as 1 per 24,000.

This great disparity in figures must indicate that everyone does not mean the same thing by cardiac arrest. One of the greatest difficulties is to know what we are talking about. To describe this entity, Natof and Sadove[1] list 12 separate and different definitions. Of these definitions, that of Blades[10] is simple and logical: "sudden cessation of cardiac function from the effects of anesthesia or surgical manipulation." If this definition were followed, many cases would be eliminated that are now called cardiac arrest and the subject could be viewed in its true perspective. Some surgeons apply the term to every patient who dies in the operating room and who is not completely exsanguinated. Obviously, every death from any cause could be called cardiac arrest, for that is the final episode in every fatality. Actually, a careful analysis of operating room deaths shows that roughly half are due to surgical accidents, shock, or primary disease and should not be termed as due to cardiac arrest.[11]

These reviews also throw doubt on the widely held theory that there is an alarming increase in the incidence of this condition. For example, at Flower Hospital, Toledo, Ohio, the operative mortality has shown a steady reduction from 1.9% in the 1930's to 1.6% in the 1950's in spite of an increase in major pulmonary and cardiovascular surgery. Certainly there has been no increase in cardiac arrest or even operating room deaths. The apparent increase must be due to a greater awareness of the problem, so that more cases are recognized and reported. We must not overlook the natural tendency to evade responsibility by saying that a death due to anesthesia is due to cardiac arrest. The latter, for which no cause is known, is obviously an act of God for which human error cannot be held accountable.

Cardiac arrest has been defined as total circulatory failure for which no cause is apparent.[4] However, in every case there is a causative factor, and the reason that it is not apparent must be because we did not look for it or ignored it if present.

Causes

Hypoxia.—Oxygen lack has a twofold effect on the heart. Central nervous system depression causes respiratory and vasomotor failure with resulting cardiac hypoxia. There is also a direct effect on the myocardium, which, unlike skeletal muscle, cannot rest to restore oxygen debt. Even short periods of suboxygenation may produce cardiac standstill. Lactic acid, the normal product of muscular activity, increases with hypoxia. With a concentration of only 0.07% it will produce cardiac

---

Anesthetist, Flower and Mercy hospitals.

Chairman's address, read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

arrest, whereas skeletal muscle will function even though the concentration is threefold. Cardiac hypoxia is produced by any factor that interferes with coronary circulation, as well as a frank low oxygen intake. This cardiac ischemia establishes a trigger zone that acts as a focus for ventricular fibrillation. Types of hypoxia and their causes include (1) anoxic, due to respiratory obstruction, low inspiratory oxygen level, or hypoventilation; (2) anemic, due to hemorrhage or anemia; (3) stagnant, due to shock, cardiac inefficiency, hypotensive drugs, or spinal anesthesia; (4) histotoxic, due to overdosage of anesthetics; and (5) metabolic, due to high oxygen demand. Hypoxia is frequently associated with, and made more dangerous by, hypercapnia.

Parasympathetic Stimulation.—Though formerly there has been skepticism regarding the vagus reflex, some reports seem to establish beyond reasonable doubt that tracheal, laryngeal, hilar, ocular, and mesenteric stimulation can produce cardiac inhibition by initiating vagus reflexes. A number of factors and agents potentiate this action. Hypoxia, hypercapnia, barbiturates, and cyclopropane are common causes.

Neostigmine is used freely as an antagonist to tubocurarine and other relaxants with similar action. It is important to remember that, unless the vagus is adequately depressed by atropine, this drug produces powerful stimulation which can (and has) initiated cardiac arrest.

Sympathetic Stimulation.—Guedel postulated that ventricular fibrillation could be produced by epinephrine released by emotional trauma incident to the induction of anesthesia.[12] The high incidence of cardiac arrest during induction lends support to this theory. Of course the danger of administering epinephrine or posterior pituitary injection (Pituitrin) in conjunction with cyclopropane anesthesia is well known. Ventricular fibrillation is to be anticipated. The preoperative preparation of the patient with adequate sedation is still vital. A recent tendency to belittle the euphoric effects of morphine is ill founded.[13] Several million narcotic addicts testify that morphine produces psychic effects that cannot be obtained with other sedative drugs.

Overdosage.—An overdose of practically any anesthetic agent will produce cardiac irregularities, vasomotor depression, and asystole. Doubtless some of this effect is hypoxic in nature, but many agents have a direct effect on the heart muscle or its conduction mechanism. The role of chloroform and ethyl chloride is well recognized. The other recently popular halogen anesthetics, trichloroethylene (Trilene) and halothane (Fluothane), seem to have similar properties, and great caution must be observed when using these drugs, for reports of cardiac arrest after their use are becoming common.[14] It is easy to give an overdose of any agent to a patient when, as is common, assisted or controlled respiration is being used.

Under normal circumstances overdose produces respiratory depression which by reducing ventilation tends to limit the amount of gas inhaled. However, when hyperventilation is artificially induced, an excess can be pumped into the circulation without the ordinary signs of deep anesthesia being present. The result is hypoxia from vasomotor depression and asystole from direct myocardial paralysis.

Trauma.—The heart may be directly embarrassed during intrathoracic surgery. This is undoubtedly a cause of the high incidence of cardiac arrest during these operations. There may be pressure on the auricles or great vessels preventing adequate filling. Wiggers describes also the onset of ventricular fibrillation by direct injury to the heart. This may be produced by external trauma as well as by direct interference with cardiac action.

Other Causes.—Less common causes of cardiac arrest to be mentioned in passing are artificially induced hypothermia and potassium or procaine intoxication. References to these are also appearing with increasing frequency.

The presence of preexisting cardiac disease, of course, makes the heart more susceptible to arrest from any of these causes. Furthermore, a damaged heart is much more difficult to restart or, restarted, to be maintained permanently with a regular efficient beat.

Diagnosis and Treatment

Diagnosis.—The diagnosis cannot be made without close observation of the patient. No anesthesia can be conducted "in absentia." A careful, conscientious, and competent individual must be in attendance constantly. Every breath must be noted, the pulse should be palpated constantly, and the blood pressure should be checked from minute to minute. An experienced anesthesiologist can often suspect cardiac distress by simple observation of the patient. Irregularities, bradycardia, or sudden hypotension are warning signs. The diagnosis is established not by electrocardiogram, or even auscultation, but by the absence of a palpable pulse in a major vessel. Treatment must be instituted without a moment's delay.

It is hoped that this presentation, by stressing that errors in technique or judgment are responsible for most cardiac arrests, might make discussion of treatment superfluous. One ounce of prevention is still worth many pounds of cure, for even under the best circumstances the results of treatment are unsatisfactory. The mortality, as quoted by various authors, is as follows: Bergner,[6] 35%; Ruth and coworkers,[15] 40%; Blades,[10] 50%; Lahey and Ruzicka,[2] 62%; Briggs and associates,[4] 63%; Freeman and coworkers,[16] 65%; and Barber and Madden,[17] 66% (average, 54.4%).

These statistics unfortunately do not give any information on one of the most distressing aspects of this subject. Many patients, listed as having recovered from cardiac arrest, undoubtedly are doomed to a hopeless vegetative existence due to cortical damage from cerebral anoxia.

Treatment.—The treatment of cardiac arrest has become well standardized and need not be discussed in detail. Artificial respiration with an adequate airway must be instituted as soon as the diagnosis is even suspected. No time should be wasted in intubation at this time. In many cases of simple hypoxia, reoxygenation will reestablish the heartbeat, but this must not be relied on. The chest must be opened immediately and alternate manual compression and decompression of the heart—not "massage"—instituted. The rate should be as rapid as diastolic filling permits, though most operators become fatigued rapidly if rates above 100 per minute are attempted. One should pause occasionally to see if spontaneous beating is resumed. Blood volume must be rapidly restored by intravenously given fluids and/or blood.

The tone of a flaccid heart may be restored by 1:1,000 epinephrine solution (5 cc.) directly injected. Its tendency to produce ventricular fibrillation must be recognized. Should this occur, electroshock with domestic current or a special defibrillator may stop the irregular contractions and allow massage to restore regular rhythm. Procaine by direct injection, topical application, or intravenous injection is recommended in an effort to overcome fibrillation by decreasing cardiac irritability.

It is difficult to predict a successful result. Patients who are moribund or have preexisting cardiac pathology will respond poorly, if at all. Each case must be individually evaluated before treatment is abandoned. Hosler[18] reported complete recovery after eight hours of continuous cardiac massage.

Successful resuscitation depends on (1) the immediate reestablishment of cardiac and cerebral oxygenation and (2) a more deliberate restoration of the spontaneous heartbeat.

Conclusions

I would make a plea to all exponent's of the art of anesthesiology that they be diligent and conscientious in preventing the tragedy of cardiac arrest. The reputation of this profession and the lives of the patients are at stake. Avoid hypoventilation with its vicious offspring, hypoxia and hypercapnia. Protect the patient against noxious reflexes by proper and adequate premedication. Mistrust the halogens. One agent well understood and administered still is more valuable than a polypharmaceutical barrage, of which the evaluation is difficult. Keep it simple, be watchful, be careful, be safe.

2228 Ashland Ave. (10).

References

1. Natof, H. E., and Sadove, M. S.: Cardiovascular Collapse in Operating Room, Philadelphia, J. B. Lippincott Company, 1958, pp. 5-92.

2. Lahey, F. H., and Ruzicka, E. R.: Experience with Cardiac Arrest, Surg. Gynec. & Obst. **90**:108-118 (Jan.) 1950.

3. Hingson, R. A.; Holden, W. D.; and Barnes, A. C.: Mechanisms Involved in Anesthetic Deaths, New York J. Med. **56**:230-236 (Jan. 15) 1956.

4. Briggs, B. D.; Sheldon, D. B.; and Beecher, H. K.: Cardiac Arrest: Study of 30-Year Period of Operating Room Deaths at Massachusetts General Hospital, 1925-1954, J. A. M. A. **160**:1439-1444 (April 28) 1956.

5. Jacoby, J.; Flory, F. A.; Ziegler, C. H.; and Hamelberg, W.: Safety in Surgery, Anesth. & Analg. **34**:346-363 (Nov.-Dec.) 1955.

6. Bergner, R. P.: Cardiac Arrest: Some Etiological Considerations, Anesthesiology **16**:177-189 (March) 1955.

7. Johnson, J., and Kirby, C. K.: Cardiac Arrest During Pulmonary Resection: Etiologic Factors and Management, Am. J. Surg. **89**:56-63 (Jan.) 1955.

8. Bonica, J. J.: Cardiac Arrest, Northwest Med. **52**:719-723 (Sept.) 1953.

9. Merritt, H. E., and Osterhagen, H. F.: Cardiac Arrest and Its Management in Rural Area Hospitals, J. Michigan M. Soc. **54**:72-75 (Jan.) 1955.

10. Blades, B.: Cardiac Arrest, J. A. M. A. **155**:709-712 (June 19) 1954.

11. References 4 and 5.

12. Harvey, W. P., and Levine, A.: Paroxysmal Ventricular Tachycardia due to Emotion: Possible Mechanism of Death from Fright, J. A. M. A. **150**:479-480 (Oct. 4) 1952.

13. Beecher, H. K.: Preanesthetic Medication, editorial, J. A. M. A. **157**:242-243 (Jan. 15) 1955.

14. Chang, J.; McCartney, H. H.; and Graves, H. B.: Clinical Experience with Fluothane, New Non-explosive Anaesthetic Agent, Canad. Anaesth. Soc. J. **4**:187-206 (July) 1957. Hudon, F.; Jacques, A.; Clavet, M.; and Houde, J.: Clinical Observations on Fluothane Anaesthesia, ibid. **4**:207-234 (July) 1957. Stephen, C. R., and others: Evaluation of Fluothane for Clinical Anaesthesia, ibid. **4**:246-258 (July) 1957.

15. Ruth, H. S.; Buckley, M. L.; and Keown, K. K.: Cardiac Asystole, J. A. M. A. **164**:831-835 (June) 1957.

16. Freeman, R. V.; Berger, L. M.; Cohen, S.; and Sells, W. A.: Major Neurological Residuals Following Resuscitation for Cardiac Arrest, J. A. M. A. **155**:107-109 (May 8) 1954.

17. Barber, R. F., and Madden, J. L.: Historical Aspects of Cardiac Resuscitation, Am. J. Surg. **70**:135-136 (Oct.) 1945.

18. Hosler, R. M.: Emergency Treatment of Cardiac Arrest, J. Internat. Coll. Surgeons **19**:336-340 (March) 1953.

ARTERIOGRAPHIC STUDIES OF THE CORONARY ARTERIES IN ISCHEMIC HEART DISEASE

Alan P. Thal, M.D., L. Stephen Richards, M.D., Richard Greenspan, M.D.
and
M. John Murray, M.D., Minneapolis

The coronary arteries have been visualized in unanesthetized patients by injecting a radiopaque medium through a catheter into the ascending aorta. After premedication with meperidine and atropine, the catheter is introduced by way of the brachial artery and inserted until its tip lies about 2.5 cm. above the aortic valve. Special techniques have been developed in order to predetermine the phase and duration of the injection, since 40 to 55 cc. of the radiopaque medium must be injected within 0.8 to 0.6 seconds and the subsequent film exposures must be properly timed. The most convincing sign of coronary artery disease is the roentgenographic finding of occlusion of a major vessel. Of the four illustrative case histories here given, two concern patients who had been considered for cardiac surgery because of signs and symptoms of angina pectoris; the arteriographic demonstration of normal coronary systems in both cases was decisive in planning subsequent treatment. Recently injections have been made during the first half of the cardiac cycle starting at systole. This has reduced the volume of contrast material needed by half without affecting the clarity of the arteriogram. In over fifty studies there have been no complications.

Recently developed techniques[1] permit the regular visualization of the blood supply of the heart in the unanesthetized patient. The fine detail of the studies now obtainable affords not only the means of precise localization of the occluding lesions of the major coronary vessels but also a detailed picture of the collateral vascular development. Apart from its investigative use, coronary arteriography is of value in elucidating difficult clinical problems and also in providing objective evidence of coronary disease prior to myocardial revascularization. The present paper serves to outline techniques recently developed in this institution. Representative cases will be illustrated.

Materials and Methods

Injection Apparatus.—In essence, the injection apparatus consists of a compressed nitrogen-driven syringe fired by a solenoid valve. The radiopaque medium in the syringe, being highly viscous, is warmed by a heat reflector. This injector is capable of delivering 65 cc. of a 90% solution of diatrizoate (Hypaque) sodium through a size 330 polyethylene catheter in one second. The detailed construction of the injector and delay circuit have been described in another paper.[1a]

Delay Circuit.—Our experimental and clinical studies have regularly shown that the best delineation of the coronary vessels is obtained by a rapid injection of concentrated dye timed to start at the beginning of systole and continue for one cardiac cycle. At heart rates from 60 to 80 beats per minute, the injection is carried out over a period of 0.8 to 0.6 seconds. To obtain precisely timed injections, a variable delay circuit has been utilized. The circuit is triggered by the R wave of the electrocardiogram and the duration of injection is varied according to the heart rate.

Catheterization of the Ascending Aorta.—While it is possible to gain access to the ascending aorta in various ways, it has seemed safest to us to adopt the route of the brachial artery. The artery is carefully exposed in the upper part of the arm, and a transverse arteriotomy is made. With use of a flexible catheter guide, the catheter is directed into the ascending aorta and positioned under the fluoroscope to lie about 1 in. above the aortic cusps. The guide is then withdrawn. After considerable trial, we have found a lateral-opening, closed-tip, size 330 polyethylene catheter to be most suitable for these studies. At the conclusion of the procedure, the catheter is withdrawn and a meticulous repair of the artery performed.

Preparation of the Patient.—Sedation is accomplished with meperidine (Demerol) hydrochloride, given intramuscularly prior to catheterization, and 0.6 mg. of atropine, given intravenously 10 minutes before the dye injection. The carotid arteries are manually compressed low in the neck during the injection to reduce the cerebral circulation of the opaque medium.

Radiopaque Mediums.—For detailed studies of the coronary circulation, it is necessary to use the newer concentrated mediums. Diatrizoate, in a 90% solution, has given satisfactory results in our hands. The viscous mediums require warming to body

---

From the departments of surgery, radiology, and medicine, University of Minnesota Medical School. Dr. Thal is an established investigator, American Heart Association. Dr. Richards is a research fellow, U. S. Public Health Service.

perature prior to injection. The volume of ma-
ial used has varied from 30 cc. to 50 cc., depend-
on the size of the patient and the heart rate.

alibration.—With use of a two-channel record-
unit, a simultaneous electrocardiographic and
tic pressure curve tracing is made. The delay be-
en the peak of the R wave and the peak of systole is measured and the delay circuit calibrated accordingly. A trial run is then made with the injector excluded from the circuit. The precise phase and duration of injection is then recorded.

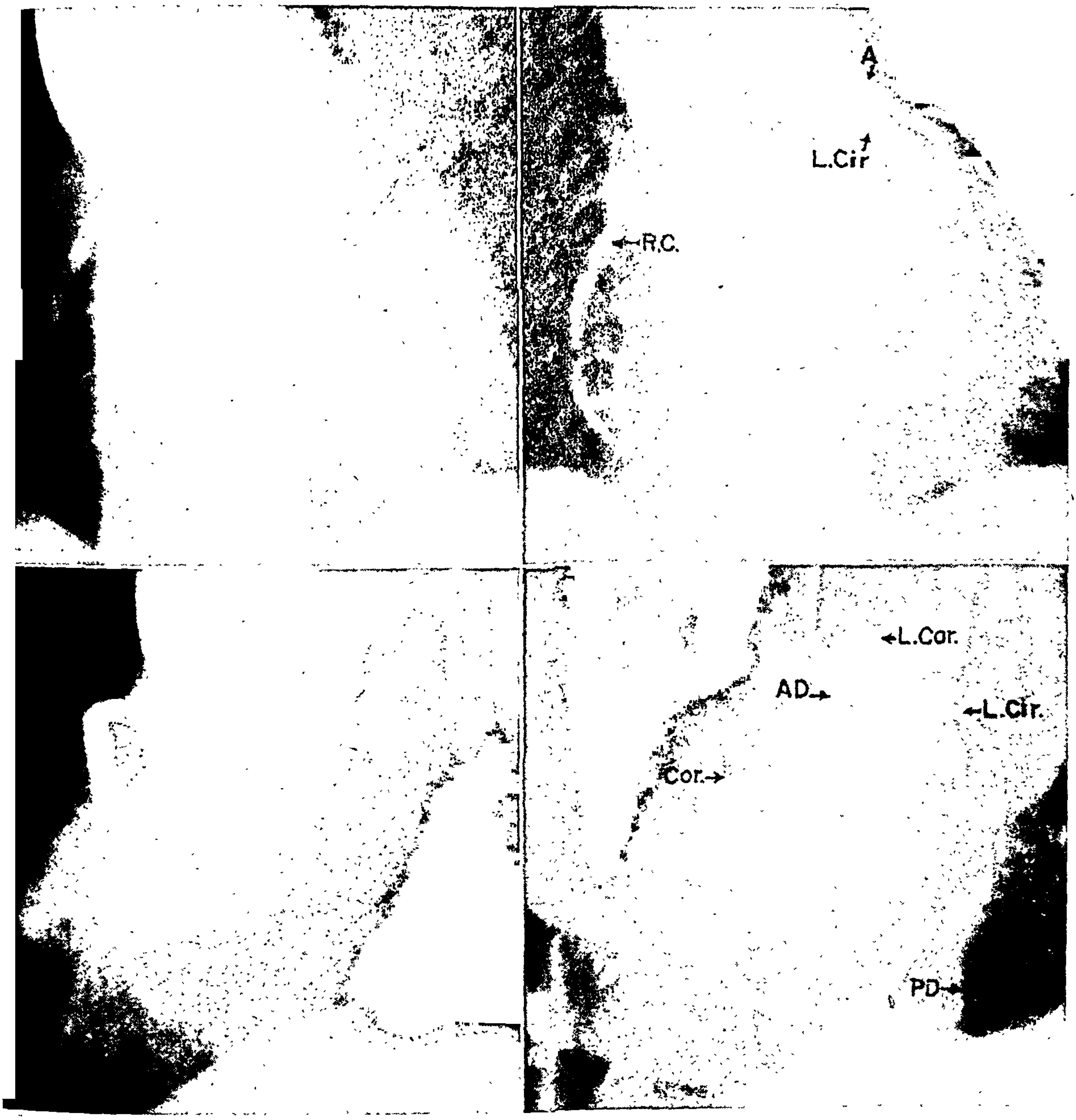


Fig. 1 (case 1).—Anteroposterior and lateral views of coronary arteriogram in patient with angina-like symptoms. Arteriogram shows entirely normal pattern. *L. Cor.* indicates left coronary artery; *R. Cor.*, right coronary; *L. Cir.*, left circumflex branch; *AD*, anterior descending branch; and *PD*, posterior descending coronary artery.

In general, at a pulse rate of 70 to 80 per minute, the actual injection can be made over 0.8-0.6 seconds. This allows for the injection of 40 to 55 cc. of radiopaque material.

Rapid Film Changer.—The Schonander biplane unit, which allows six films per second in two planes, has proved satisfactory for detailed studies of the coronary circulation. As has been shown in peripheral arteriography, films taken in one plane may give an erroneous idea of vessel caliber. The anterior descending branch of the left coronary artery is best seen in the posteroanterior view, while the right coronary and left circumflex branch are best studied in lateral view.

The following cases were selected to demonstrate the value of coronary arteriography both in the resolution of difficult clinical problems and in the investigation of the pathological anatomy in severe coronary sclerosis.

Report of Cases

Case 1.—A 55-year-old woman was first seen on March 18, 1958, with a three-year history of chest pain on exertion. The pain was described as being retrosternal with radiation down the left arm to the wrist. It would occur initially only on moderately severe exertion and, at that time, was promptly relieved by cessation of activity. The severity and frequency of the pain increased, requiring nitroglycerin for relief. When first seen, pain would occur spontaneously at rest and she had been taking meperidine, promazine (Sparine) hydrochloride, and occasional injections of morphine sulfate for relief. She was described as being extremely dependent on her doctors. She was apparently subject to moderately severe depression. This patient was referred to the Univer Hospitals for surgical revascularization of the heart. T physical examination revealed a mild degree of rheumat arthritis involving the proximal interphalangeal joints of hands only, a blood pressure of 120/90 mm. Hg, a pulse r of 84 per minute, which was regular, no evidence of placement of the apex beat, no abnormal heart sounds murmurs, and no evidence of congestive heart failure. electrocardiogram taken when she was at rest revealed abnormalities. In view of the patient's personality prob and her knowledge of the symptoms of coronary ar disease, it was felt that there was considerable doubt ab the diagnosis of angina pectoris. Accordingly, a coro arteriogram was performed. This is illustrated in figure 1 *is interpreted as showing a normal coronary system.* W the patient was confronted with this evidence, the chest pain disappeared. However, within a few days she developed pain in her legs, of similar character.

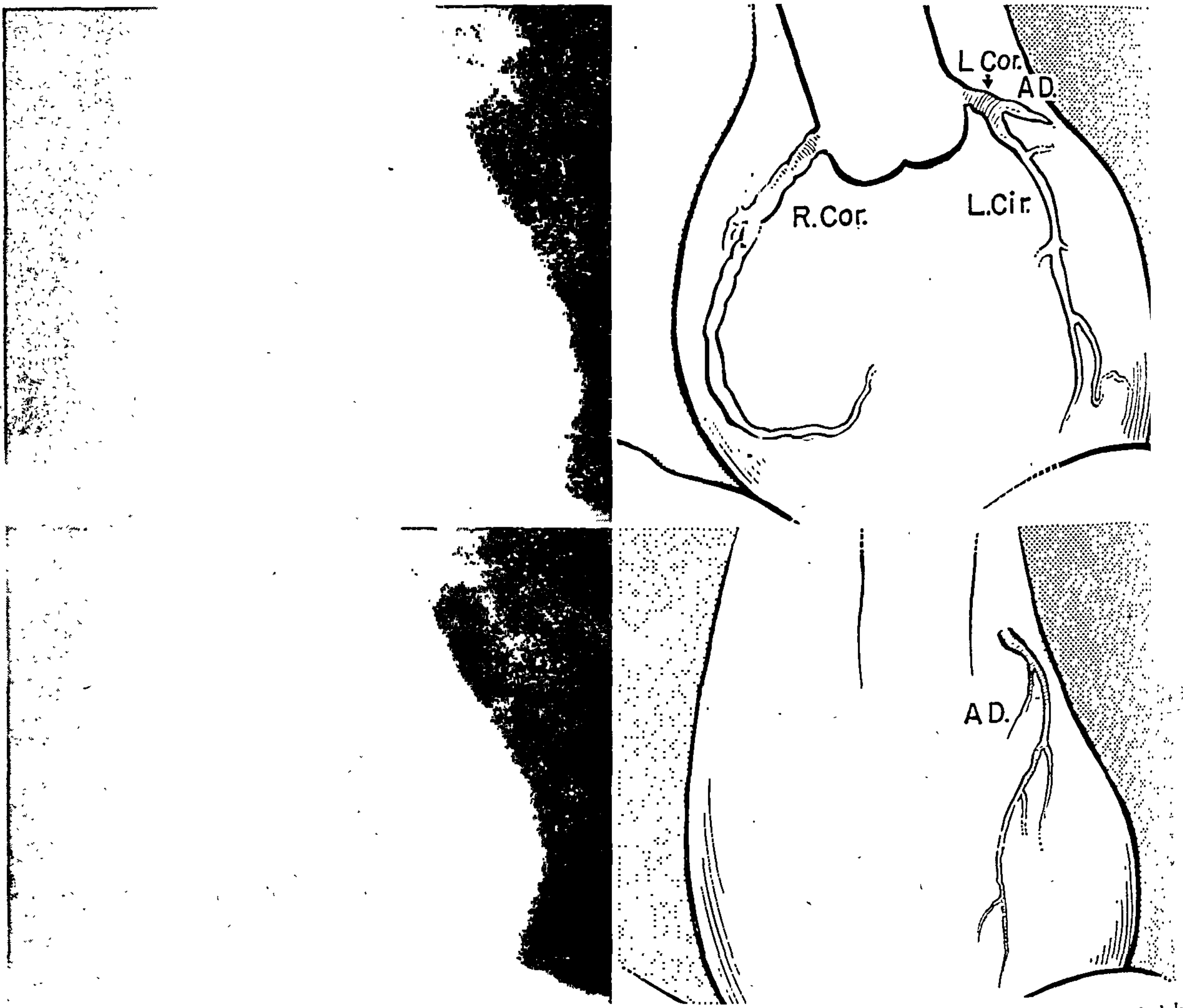


Fig. 2 (case 2).—Arteriograms with corresponding drawings (*top*), showing generalized narrowing and irregularity of whole coronary system with complete occlusion of anterior descending coronary artery near its origin and (*bottom*), taken several seconds later, demonstrating reflux filling of anterior descending coronary artery from collaterals over apex of heart.

Case 2.—A 53-year-old man was first seen on March 11, 1958, complaining of chest pain on exertion, which had been present for 18 months but had become worse since July, 1957. He first noticed the onset of retrosternal squeezing pain with radiation to both arms while working or walking. Initially, the pain was relieved promptly by ceasactivity or by taking nitroglycerin. The condition pro- sed so that at the time of admission even the mildest tion precipitated pain lasting up to 10 or more minutes. physical examination was entirely unrevealing, the d pressure being recorded at 140/85 mm. Hg, with no lence of cardiac enlargement, abnormal heart sounds, or murs. There was no enlargement of the heart on x-ray, the electrocardiogram showed inversion of T waves in ls 1, aVL, V_3, V_4, and V_5 consistent with myocardial iemia. *Coronary arteriograms* (fig. 2) *demonstrated com- e occlusion of the anterior descending branch of the* coronary artery, with diffuse atherosclerosis of the whole onary system. It is of interest that intercoronary collateral v was well established and there was retrograde filling the occluded anterior descending artery. This patient ob- ed *some immediate subjective improvement after peri-* dial poudrage.

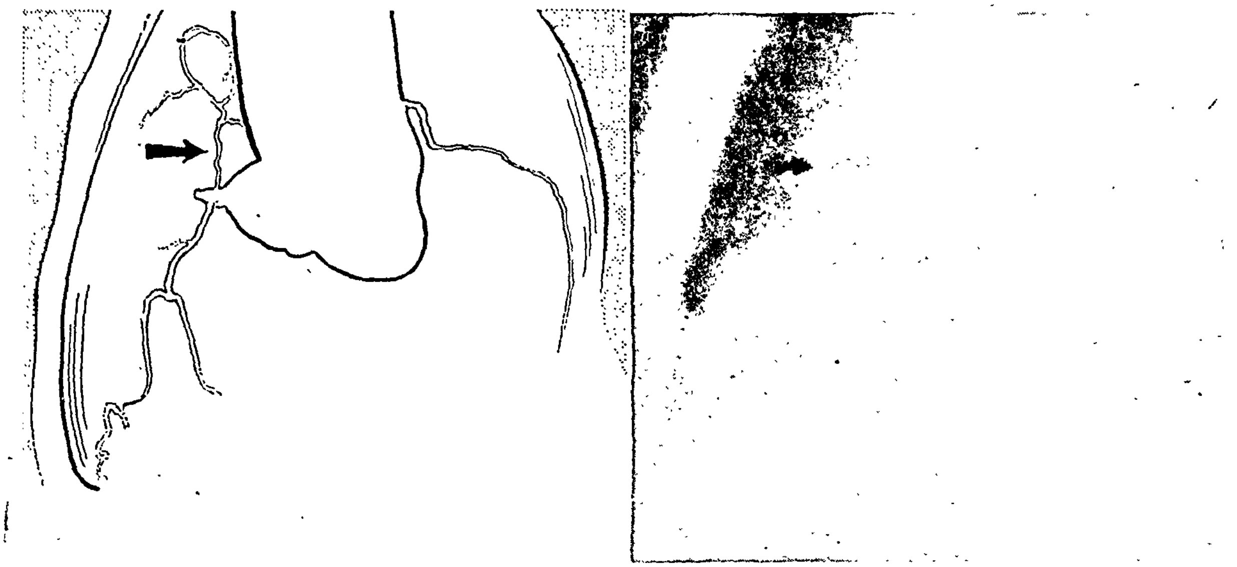


Fig. 3 (case 3).—Extreme coronary sclerosis with occlusion and recanalization of left main coronary. Lateral view shows extensive collateral vessels anterior to aorta. This trunk represents ramus ostii cavae superioris, which takes origin from right coronary artery.

Case 3.—A 52-year-old man was first seen on Dec. 20, 57, complaining of chest pain on exertion since 1955. tially, the pain occurred on exertion or in the early hours the morning, when it awakened him from sleep. It was rosternal, with radiation into the left arm to the finger- s. Initially, it was relieved by nitroglycerin, the efficacy of which became less as time went on. On May 27, 1957, he had an attack of severe chest pain at which time a diagnosis of myocardial infarction was made. After this he continued to have attacks of pain at rest and on mild exertion, as well as during the night. Physical examination revealed a blood pressure of 150/90 mm. Hg, no cardiac enlargement, and no congestive heart failure, but the presence of an atrial gallop in the apical region was noted. The electrocardiogram taken at rest was reported within normal limits, and the chest x-ray confirmed the absence of cardiac enlargement. The serum cholesterol level was recorded as 272 mg.%. Coronary *arteriograms revealed generalized narrowing of the whole coronary system with multiple and extensive occlusions of the anterior descending branch of the left coronary artery.* There was prominent filling of small extracardiac vessels at the base of the heart in the anterior mediastinum. These presumably represented expansion of the vessels over the pulmonary conus. Subsequently, the internal mammary artery was implanted into the myocardium. The patient tolerated this well. However, about two hours after operation he died suddenly in ventricular fibrillation. The extreme degree of atherosclerosis is illustrated in figures 3 and 4. The possibility exists that disruption of anterior mediastinal collateral vessels during mobilization of the internal mammary artery further diminished an already marginal blood flow to the heart.

Case 4.—A 24-year-old woman was first seen on Jan. 13, 1958. Heart trouble was apparently initially suspected at the age of 9 years, when a cardiac murmur was first noted and attributed to rheumatic fever. She remained reasonably well, however, apart from easy fatigability on strenuous exertion, until 1955, at which time she noticed shortness of breath spontaneously and on exertion. For one year she had noticed fleeting stabbing pains located in the center of the anterior part of the chest; this seemed to be worse after exertion. Two weeks before admission she had noticed a severe generalized crushing pain in the anterior part of the chest, lasting two minutes and associated with shortness of breath and sweating but apparently unrelated to exertion. Examination revealed no cardiac enlargement, a blood pressure of 100/70 mm. Hg, and a pulse rate which was regular at 68 per minute. There was no evidence of congestive heart failure, but there was a loud third heart sound audible both at the apex and along the left sternal border, while at the pulmonic area there was a moderately loud systolic murmur of the ejection type.

The pulmonary second sound was not accentuated and was normally split. The electrocardiogram revealed inversion of T waves in leads 2, 3, aVF, V_2, V_3, V_4, V_5, and V_6, as well as depression of the ST segments in leads 2, 3, aVF, and V_6. This electrocardiogram showed no change over one taken four years previously. Cardiac fluoroscopy revealed a heart well within the normal limits of size and configuration, although there was a question of right ventricular enlargement. Right heart catheterization was performed, and the findings were entirely within normal limits. It was felt that possibly this woman had an anomalous origin of one coronary artery to account for what resembled either ischemic heart disease or a myocardiopathy of unknown origin. A coronary arteriogram was taken. As shown in figure 5, this showed a completely normal coronary system.

Arteriographic Signs of Coronary Artery Disease

The most definitive sign of coronary arteriosclerosis seen on angiography is a complete or partial occlusion of a major vessel. This is most commonly seen in the proximal reaches of the anterior descending branch of the left coronary artery and may be manifested by a gradual tapering of the vessel lumen, by a complete and abrupt obstruction to the column of dye, or by an atheromatous encroachment on the lumen. Frequently, small tortuous vessels can be seen bypassing such an occlusion or feeding its distal portion by collateral from an adjacent artery. While these occlusions may form the most striking feature of a coronary arteriogram, diffuse disease of the whole system is shown by gross irregularity of the intimal surface and rigidity of the vessel during systole and diastole. In aged patients without evidence of myocardial ischemia, extreme tortuosity and microaneurysm formation is common. A complete and dynamic impression of the coronary topography in disease can only be secured by viewing multiple films taken in two planes. In this way, retrograde filling of an obstructed coronary artery may be seen in late films.

Another sign which is encountered only in patients with extremely advanced disease is stasis of radiopaque material in peripheral areas of the coronary circulation, where proximal obstructio has brought about considerable slowing of th blood flow. In two patients with intractable angin pectoris at rest, we have demonstrated extensiv atrial and anterior mediastinal collateral vessel These vessels appear to be expansions of the no mal small vessels at the base of the heart emanatin from both right and left coronary arteries and normally ramifying over the atria, the pulmonary conus, and the superior vena cava. It is quite possible that they represent an expanding collateral circulation which develops as a result of extreme ischemia. The branching vessels seen anterior to the aorta in figure 3 represent the ramus ostii cavae superioris [2] which supplies the sinoatrial node and forms collaterals around the atria, with the pericardiophrenic artery, and other extracardiac vessels.

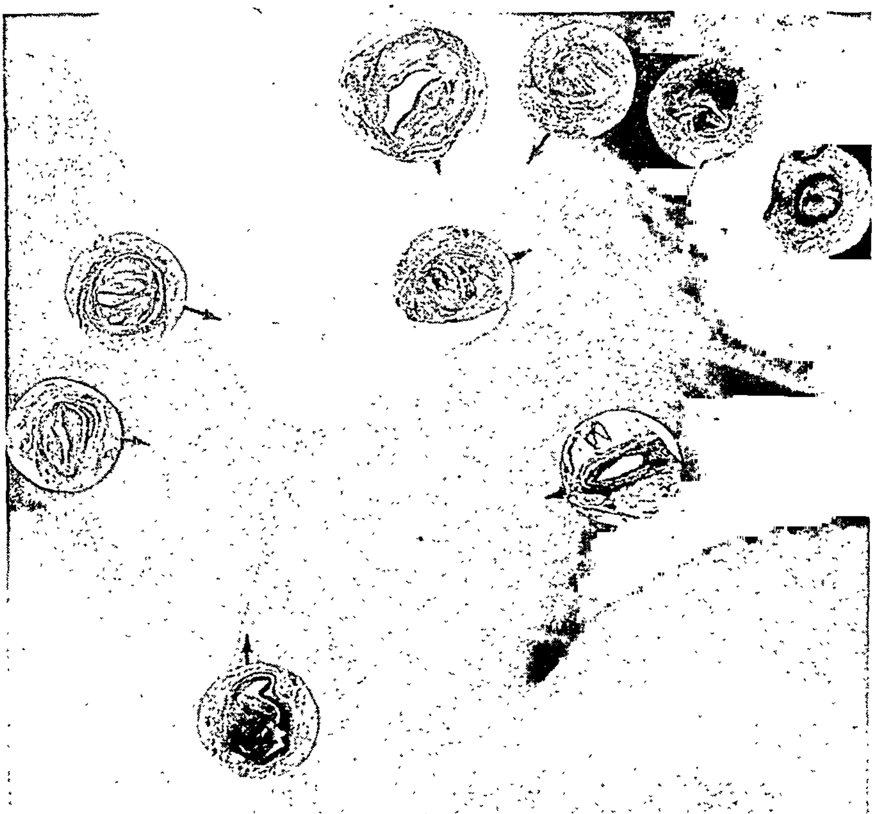


Fig. 4 (case 3).—Sections of coronary arteries shown superimposed on arteriogram of patient with severe angina at rest. Extreme degree of narrowing extending far out into periphery is shown.

Comment

In 1955 we developed techniques for direct anastomoti bypass of experimental coronar occlusion.[3] This work was base on the premise that the coronar arterial disease was often localized to the first portions of th main coronary arteries. Our subsequent arteriographic studie suggest that this concept is erroneous. The patient with angin on effort appears to have diffus disease of the whole coronar arterial system, while in the patients we have studied with angina at rest there appears to b an additional impairment of th collateral circulation. In the 5 patients we have now studie there have been two instances o segmental arterial block. Both o these patients are asymptomati This situation is quite analogou to that seen in the experimenta animal, which survives a punctate occlusion in the presence o an otherwise normal coronary vasculature. Thes findings then make it appear unlikely that direc coronary artery surgery will be effective in th treatment of ischemic heart disease.

While the diagnosis of myocardial ischemia ca frequently be made with great accuracy on th basis of the history and electrocardiographic findings, yet there remains a small but definite group o patients in whom the diagnosis remains in doubt i spite of careful clinical study. These problem case may readily be resolved by coronary arteriograph which, in our experience, may now be done wit small risk and little discomfort to the patient.

It is now apparent from the results of various types of surgical procedures for myocardial revascularization that there is a strong functional element in many patients with angina pectoris. The extent of this functional overlay can be judged from the occasional patient with established angina pectoris who obtains complete relief of his symptoms after nothing more than a skin incision. Within the last eight months, among the patients referred to this hospital for myocardial revascularization operations, four were found to have entirely normal coronary arteriograms and in each instance the chest pain was greatly ameliorated or disappeared after the patient was informed that the coronary system was normal. The percentage of such patients included among the successful results of myocardial revascularization is unknown, but it is apparent that coronary arteriography would be of value in eliminating this type of patient as a surgical candidate.

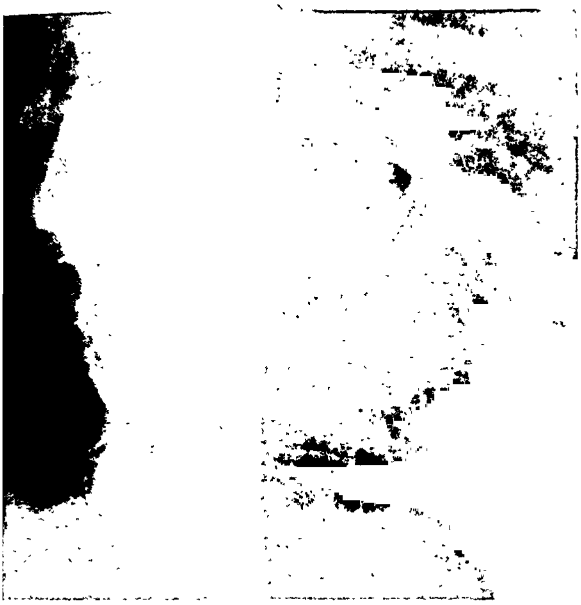


Fig. 5 (case 4).—Coronary arteriogram, showing entirely ıormal pattern. Large, smooth-walled vessels may be conrasted with extreme narrowing seen in figure 3.

Quite apart from the diagnostic value of these studies, it may be possible with increased experience to formulate a more accurate prognosis in coronary sclerosis based on such factors as the extent of the disease and the collateral response. Last, but perhaps most important, the method offers a basic research technique for evaluation of the early vascular reactions to ischemic myocardial insult.

Summary

Recently developed techniques for coronary arteriography have made possible a quality of arteriogram which allows critical study of the coronary arterial system in patients with severe coronary sclerosis. In four representative cases, two patients originally referred for surgical treatment were shown to have normal coronary vessels. The most definitive roentgenologic sign of coronary artery disease is complete or partial occlusion of a major vessel.

This study was supported by grants from the U. S. Public Health Service and the Minnesota Division, American Heart Association.

The diatrizoate sodium used in this study was supplied as Hypaque-M, 90%, by Winthrop Laboratories, New York.

References

1. (*a*) Richards, L. S., and Thal, A. P.: Phasic Dye Injection Control System for Coronary Arteriography in Human, Surg. Gynec. & Obst. to be published. (*b*) Thal, A. P.; Lester, R.; Richards, L. S.; and Murray, J.: Coronary Arteriography in Arteriosclerotic Disease of the Heart, Surg. Gynec. & Obst. **105**:457-464 (Oct.) 1957.

2. James, T. N., and Burch, G. E.: Atrial Coronary Arteries in Man, Circulation **17**:90-98 (Jan.) 1958.

3. Thal, A.; Perry, J. F.; Miller, F. A.; and Wangensteen, O. H.: Direct Suture Anastomosis of Coronary Arteries in Dog, Surgery **40**:1023-1029 (Dec.) 1956.

PROGNOSIS OF MYOCARDIAL INFARCTION.—As emphasized in the 1941 and 1956 reports, the most important clue favoring longevity and a return to a normal program of life [in 200 patients with coronary thrombosis and myocardial infarction] was found to be the degree of completeness of recovery after the first month of convalescence from the acute attack. Of the 24 cases who showed neither myocardial nor coronary insufficiency, 18 (75%) survived five years, while the average survival of these 24 cases was 12 years. Among those who, free of complications, completely recovered from their attack, the eventual cause of death was most commonly coronary, either recurrent thrombosis or sudden death, with or without evident angina pectoris. . . . Not infrequently during the 1920's the treatment and cooperation of patients . . . were inadequate. . . . Our attitude concerning the prognosis of coronary thrombosis with myocardial infarction will undoubtedly be much more optimistic in the future than it has been in the past because of the recognition of mild cases, the better treatment and program after recovery, and the more satisfactory understanding and cooperation of the patient.—P. D. White, M.D., E. F. Bland, M.D., and S. A. Levine, M.D., Further Observations Concerning the Prognosis of Myocardial Infarction due to Coronary Thrombosis, *Annals of Internal Medicine,* January, 1958.

SOME NEW CONCEPTS OF CORONARY HEART DISEASE

RESULTS AFTER SURGICAL OPERATION

Claude S. Beck, M.D., David S. Leighninger, M.D., Bernard L. Brofman, M.D.
and
Jess F. Bond, M.D., Cleveland

In disease of the coronary arteries the myocardium is handicapped and endangered by ischemia; correction of this condition is the aim of the operation described here. With the patient under general anesthesia, the pericardium is opened. The parietal pericardium is abraded. A constricting ligature is usually placed about the coronary sinus, and before the end of the operation it is tightened to narrow the sinus to a diameter of 3 mm. Powdered asbestos is lightly sprinkled over the surface of the heart. The parietal pericardium is not closed, but the pericardial fat is sutured over the exposed surface of the heart. The mortality rate from this operation was found to depend entirely on how high a percentage of patients with advanced coronary disease were included in the series. In 110 patients with initially poor prognosis approaching the terminal stage, the hospital mortality was 11%; among the remaining 234 patients, the hospital mortality was 3%. Subjective benefits from the operation included relief from pain and reduced intake of medicaments. Objective evidence of benefit included return to gainful occupation, rise in skin temperature of extremities, disappearance of arrhythmias, and increased force of heartbeat as recorded by ballistocardiogram. The lasting effects of the operation contrasted strongly with the temporary effects of medication.

Direct operative procedures carried out on the heart and on the coronary blood vessels of dogs have yielded some new and different points of view concerning coronary heart disease.[1] Reference is made to it as a background for this report, which concerns the operation on humans.

Effective Treatment

The starting point for effective treatment of coronary heart disease concerns blood supply to ischemic muscle. Any medicament or any surgical operation that increases the amount of blood in ischemic muscle (distal to stenosis or occlusion in an artery) is obviously beneficial. This statement may be considered as an axiom or as a self-evident truth concerning treatment of this disease. Addition to this amount of blood is beneficial; reduction has the opposite effect.

Total Coronary Artery Inflow.—The myocardium requires a certain amount of blood to sustain the heart beat. The total capillary flow for the human is about 250 cc. per minute and for the dog about 100 cc.[2] The normal coronary arteries are capable of carrying much larger quantities than these amounts, and, therefore, the arteries can be narrowed severely before inflow becomes inadequate. Inadequate inflow is one of the factors that kills, and it occurs with or without infarct in the muscle.

Several surgical operations have been devised to increase total inflow. In general, the statement can be made that the heart resists the entrance of outside blood. It is not impossible to add blood to the heart because specimens exist which demonstrate blood vessels between grafts placed on the heart and the heart itself, and these are large enough to carry blood, but they cannot be produced with any degree of regularity. Perhaps better grafting methods can be developed in the future. Another approach to augment inflow consisted of putting arterial blood into the coronary sinus and diverting it in a retrograde direction through the capillary bed. This works satisfactorily for about six weeks, and then intimal thickening in the veins begins to block off inflow. However, the heart is protected by another mechanism (to be discussed later) after retrograde flow no longer occurs. Another possibility for the addition of blood concerns surgical procedures on the diseased arteries themselves.

Restoration of Lumina of Coronary Arteries: To clean out the debris from these arteries (endarterectomy) and to reestablish their lumina is an attractive idea because, being an extirpation procedure, it is readily understood. The question is: "Can it be done successfully in arteries of such small size and also when the disease is usually widespread and rarely localized to one short segment of artery?" Experience with this procedure is being

---

From the Western Reserve University School of Medicine, the University Hospitals, and Mount Sinai Hospital.

Read before the Section on Surgery, General and Abdominal, at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

obtained, and this should give an answer to this query. Our experiences on the dead heart indicated that endarterectomy will probably not be successful. The disease usually extends into secondary arterial branches, and manipulation of a stenosed artery may produce occlusion of the artery.

Distribution of Blood in Coronary System: The heart enjoys an even distribution of the blood that gets through the diseased arteries. In many patients with the disease there is enough blood getting into the heart to provide adequate function, but its distribution is at fault. It is an uneven or checkerboard distribution, and this produces pain and self-electrocution of the heart. Indeed, this is the most common cause of death. It occurs when the patient is on the golf course, while he is shoveling snow, watching athletic contests, in the office, at work, and so on and often in hearts that anatomically are too good to die. It is a physiological type of death, and the coroner or pathologist is often hard pressed to explain it. There may be no infarct and no occlusion, only narrowing of an artery. In the experimental laboratory and by successive operations all coronary arteries in the dog were occluded except for a 1-mm. lumen in the circumflex artery, and these dogs were active and in good health.[3] The factor that made these occlusions possible was the presence of a good set of intercoronary vessels that were produced by surgical operation before the arteries were occluded, so that a red blood cell, once it got past the stenosis in the circumflex artery, could go anywhere within the substance of the heart where it was needed most. Enough blood to support the heart beat can go through an opening of 1 mm. in diameter. In the human enough blood to support the heart beat can go through a stenosis of 1.5 mm. in diameter. A good set of intercoronaries is necessary to prevent fibrillating currents as stenosis and occlusion progress to the terminal stage of inflow reduction.

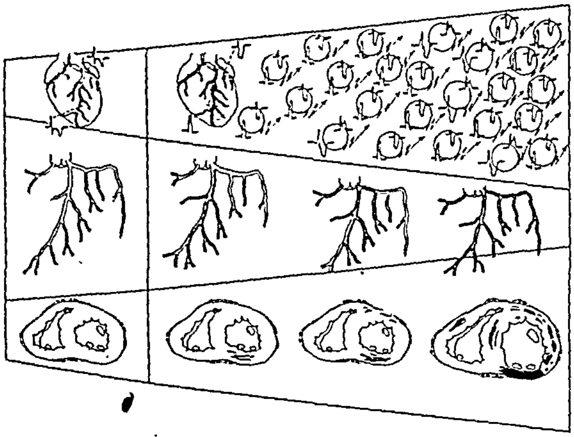


Fig. 1.—Death factors in coronary heart disease. *Top*, uneven distribution of blood producing oxygen differentials and electric condition that can destroy heart beat. *Center*, reduction of inflow; not enough blood to support heart beat. *Bottom*, muscle destruction; not enough muscle to maintain adequate circulation; death results from myocardial failure.

Muscle Failure.—Another way by which the disease kills is by destruction of muscle. One artery after another becomes occluded; one segment of muscle after another becomes scarified; there is not enough muscle to produce effective blood pressure; the patient dies in failure. The heart escaped fibrillation while these occlusions occurred. The electric alterations produced by occlusion were never strong enough to kill, and, indeed, the total inflow might be adequate to support the heart beat. This has been referred to as muscle death. The three death factors in the disease are shown in figure 1.

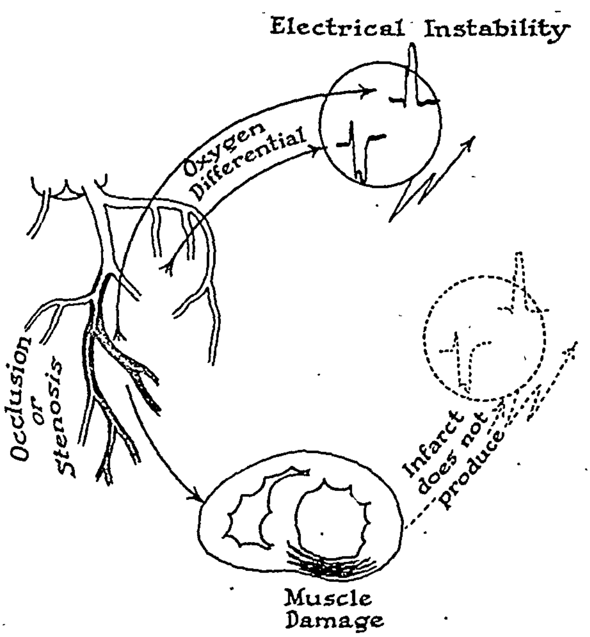


Fig. 2.—Two sequelae which may occur after stenosis or occlusion of artery. One is unstable electric condition due to oxygen differentials in muscle and other is infarct.

Two sequelae of occlusion are shown in figure 2. Occlusion produces an oxygen-differential in contiguous areas of muscle which in turn produces anginal pain and an electric condition that can fibrillate the heart. Also, occlusion may produce death of muscle. These two sequelae are not related. The heart can electrocute itself in the absence of an infarct. Likewise an infarct can develop without electrocuting currents. It is well to bear these facts in mind because the diagnosis of a mild occlusion is often made and the patient dies. A human can have a small infarct but not a mild occlusion. A mechanism that has the potential of death should scarcely be referred to as "mild."

Value of Operation.—There are certain things that surgical operation can do and there are certain things that it cannot do. Let us consider the three death factors of the disease. For oxygen differentials, anginal pain, and electric instability surgical operation is beneficial, and it is beneficial because it produces intercoronary vessels. For inflow reduction which is approaching the terminal stage surgical operation is probably not effective; perhaps more effective methods can be developed. For muscle damage operation is not effective; muscle cannot be restored. Self-electrocution is always a threat in the presence of coronary artery disease. Intercoronaries are always a protection against this factor, and they protect until inflow reduction becomes terminal.

Blood Supply into Ischemic Muscle, as Influenced by Glyceryl Trinitrate and by Operation.— A large number of backflow determinations have been made in our research laboratory, and a considerable experience with this method of study has been acquired. These measurements are important because they are a measure of the amount of blood that is in a segment of ischemic muscle. This method measures the axiom of treatment. These measurements are done by ligating the circumflex artery at its origin and then cutting the artery distal to the ligature. A cannula with two connections is inserted into the cut artery so that backflow from the artery can be collected and measured and also for perfusion of the artery between determinations by a connection with the carotid artery. Measurements of backflow are made for 30 seconds; then the artery is perfused from the carotid in order to preserve the heart beat.

The effect of glyceryl trinitrate was measured by 43 determinations on 21 normal dogs. This drug increased backflow an average of 0.88 cc. or 10 drops per minute. The range was from 0.0 to 4.0 cc. Statistically these figures are highly significant. The drug-effect lasts for about five minutes. The statement can be made that this drug adds blood to ischemic muscle from adjacent muscle with a good blood supply. This addition of blood reduces the differences in oxygen content in muscle and helps to bring about a more even distribution. This in turn reduces pain and, no doubt, protects the heart. The drug-action is temporary. This drug does not produce intercoronary vessels. The Beck operation adds 4.7 cc. or 47 drops per minute to the quantity already there, and it is a permanent addition. Patients having used this drug while on a medical regimen and then later having gone through surgical operation are in a position to evaluate and compare both forms of treatment. The clinical benefit obtained by these patients from this drug and from surgical operation gives new significance to 10 drops and 47 drops, respectively, per minute to ischemic muscle as produced by these two forms of therapy.

Preoperative Considerations

The ideal patient for operation is one who has anginal pain and an adequate total arterial inflow. The patient with adequate inflow needs a more even distribution and operation accomplishes this. It need scarcely be stated that anatomic disease in muscle and/or arteries cannot be eradicated by surgical operation. A patient with severe muscle destruction and failure is not acceptable for operation nor is the patient with terminal disease in the arteries. Inflow reduction approaching the terminal stage may occur in hearts that do not have a gross infarct. These hearts are irritable at operation, and they are susceptible to fibrillation. This condition cannot always be recognized before operation.

The studies carried out before operation are not more extensive than necessary. They consist of fluoroscopic and x-ray examination of chest, electrocardiogram with or without exercise, the ordinary laboratory tests, and special studies only when indicated. Diagnosis is often based on a good history. If there is any doubt concerning diagnosis, operation is delayed or not done. Operation is delayed if there is any recent activity in the disease. It is not done within six months after an infarct. A serious program against obesity is carried out before operation. Almost all of our patients stop smoking and do not take it up later. The mental attitude of the new patient is helped by talking to patients who have been operated on. The patients operated on are very willing to do this. The patient is told that if his blood pressure falls while he is under anesthesia, operation will not be done. This reduces the disappointment if it is not done. He is told to expect incisional pain and that pills for anginal pain will be at his bedside. He is told that when he awakens in the recovery room he will have a tube in his nose for oxygen, that a tube will be in his chest for drainage, and that a needle will be in a vein for administration of fluid.

Instruction concerning physical therapy is given. This consists of several exercises. The patient is taught postural drainage lying on the right side at a 45-degree angle for 15 minutes. After postural drainage the patient coughs for about five minutes while an attendant splints the lower part of the chest with a towel drawn taut around him. He is taught diaphragmatic and abdominal breathing. These muscles are used while the chest is in an expanded position. Arm and shoulder exercises are done. The range of motion is determined before operation, and this amount of motion is obtained after operation. Postural drainage, coughing, diaphragmatic breathing, and arm-shoulder exercises are taught before operation and are resumed the day after operation and done three times daily for one week. They reduce pulmonary complications and prevent the development of a frozen shoulder. They also reduce the reaction of being an invalid after operation, and the patients do not object to them after they once get started.

Technique of Operation

The patient is given a general anesthetic. An intratracheal tube and a mechanical respirator are used. The patient is connected to a cardioscope. Relaxing drugs and light anesthesia are used. The patient is turned on his right side. If the arterial pressure should fall below 90 mm. Hg and if it does not recover within 30 minutes without the use of pressor drugs, use of the anesthetic is discontinued and operation is not done. A fall in pressure indicates severe inflow reduction. The incision is placed between the fifth and sixth costal cartilages and ribs and is about 20 cm. in length. The latissimus dorsi muscle is elevated, and the intercostal muscles are undercut (fig. 3). A self-retaining retractor is placed, and the ribs are spread apart about 10 cm. (fig. 4).

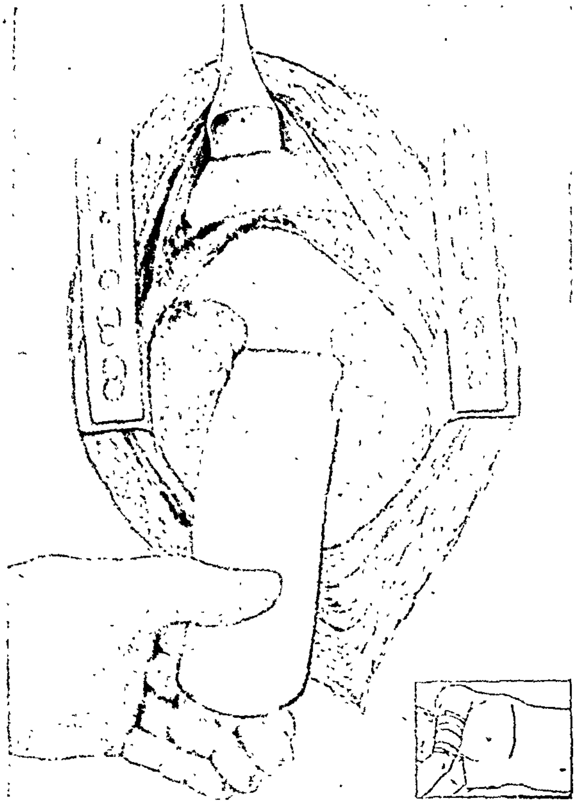


Fig. 3.—Latissimus dorsi muscle is elevated. Intercostal muscles are cut between fifth and sixth ribs for length of about 25 cm. Inset shows position of patient on operating table and location of skin incision.

The blood supply to the fat on the pericardium is preserved as much as possible. The pericardium is opened from apex to base, and traction sutures are placed in the pericardium (fig. 5). The heart is examined and data are obtained as follows: the size of the heart—normal or enlarged; character of beat—uniform, a roll (indicating a scar), or reduced or absent pulsation in any area; a bulge or aneurysm; irritability to touching; soft, thickened, or calcified common left artery as indicated by light palpation with a finger; streaking, beading, or reduced pulsation in descending artery and its branches and the branches from the circumflex artery; and infarct on the surface. The heart is tipped up for examination of the posterior surface (fig. 6). Occasionally this cannot be done because of irritability.

If the common left artery is soft one can conclude that inflow is satisfactory, that distribution is the problem, and that a favorable result can be expected. If the anatomic disease is not severe, a good prognosis can be given; if it is severe, it is classified as salvage and a guarded prognosis is given. The lining of the parietal pericardium is abraded; care is taken not to stretch or contuse the left phrenic nerve. The heart is gently rotated to expose the coronary sinus. A needle carrying a piece of silk is passed around the sinus about 2 cm. from the point where it empties into the right auricle. Usually the middle cardiac vein empties into the sinus beyond this constricting ligature. If the heart is enlarged so that exposure of the sinus is difficult or if the heart is irritable or if the sinus is covered with fat and cannot be located, this part of the operation is omitted.

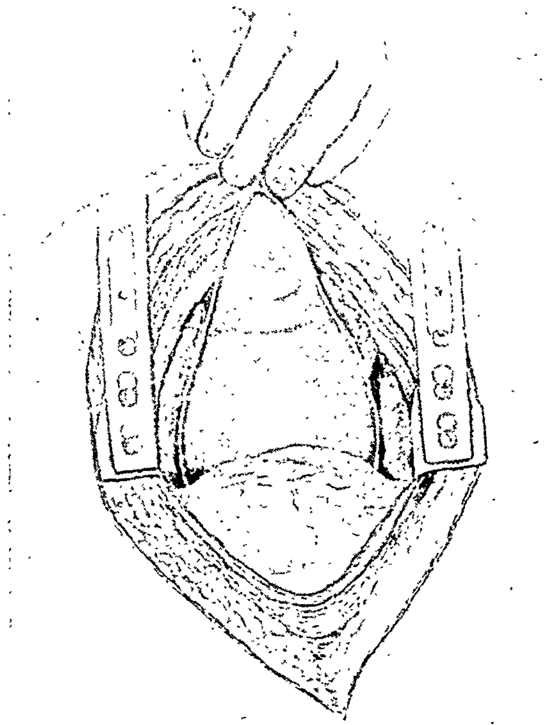


Fig. 4.—Special retractor on lung. Left phrenic nerve and fat on outside of pericardium are shown.

The next step consists of gentle abrasion of epicardium between branches of the arteries and making a light application of 5% aqueous solution of trichloroacetic acid freshly prepared to the surface of the heart between the secondary branches of the major coronary arteries. If the heart is irritable, abrasion is omitted. The next step consists in narrowing the coronary sinus to a diameter of 3 mm. This is done by tying a knot in the silk already placed over a probe of this size and then removing the probe. A light sprinkling of powdered asbestos is placed on the surface of the heart. The parietal pericardium is not sutured, but the fat is sutured so as to cover the anterior aspect as much as possible as a graft. This complete procedure is carried out when the heart is stable and tolerates manipulation. If the heart is irritable, the operation is limited to application of trichloroacetic acid and powdered asbestos. A tube with an underwater seal or suction is placed low in the midaxillary line for 48 hours. The intercostal nerves on the left are injected with tetracaine (Pontocaine) hydrochloride before closure is done. Oxygen is given through an intranasal tube for several hours.

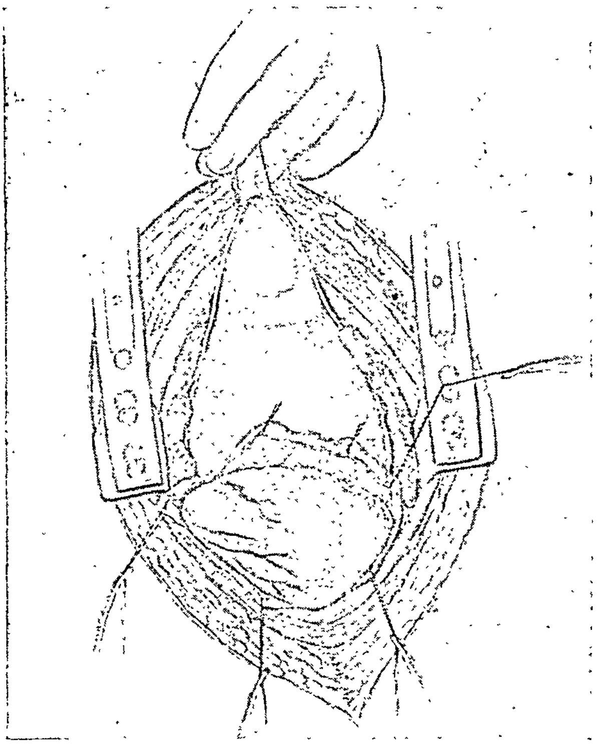


Fig. 5.—Pericardium opened medial to phrenic nerve; traction sutures in pericardium; heart exposed. Branches of descending and circumflex arteries are seen. Infarct is in left ventricle. Branches from descending ramus showed reduced pulsation.

It is possible to do the operation with a low mortality. We did 100 consecutive operations with zero mortality. If patients with severe inflow disease are selected, then there will be some mortality. Such patients would have a limited expectancy without operation. When operating on hearts that are very irritable, the extent of the procedure is reduced. Some of these hearts can scarcely be touched at operation. In such cases the application of trichloroacetic acid and asbestos powder constitute the operation.

Use of Drugs.—All patients are digitalized before operation. The drugs used preoperatively are morphine, pentobarbital sodium, and atropine. In the operating room the patient is given glyceryl trinitrate if he has anginal pain and promethazine (Phenergan) hydrochloride, 0.0373 to 0.050 Gm., is given intravenously if the patient is apprehensive. The patient is well ventilated with oxygen. Thiopental (Pentothal) sodium and succinylcholine chloride are given intravenously. An intratracheal tube is inserted. Respiration is usually assisted because of apnea and on resumption of spontaneous respiration *d*-tubocurarine chloride is given and respiration is taken over by the Rand-Wolfe respirator. The use of a mechanical respirator is recommended. Anesthesia is maintained with nitrous oxide and a small amount of ether. Tubocurarine is given as necessary to control the motion of the diaphragm. Plane 1 anesthesia is used throughout the operation, and analgesia is used for closure. The patient is awake when the intratracheal tube is removed.

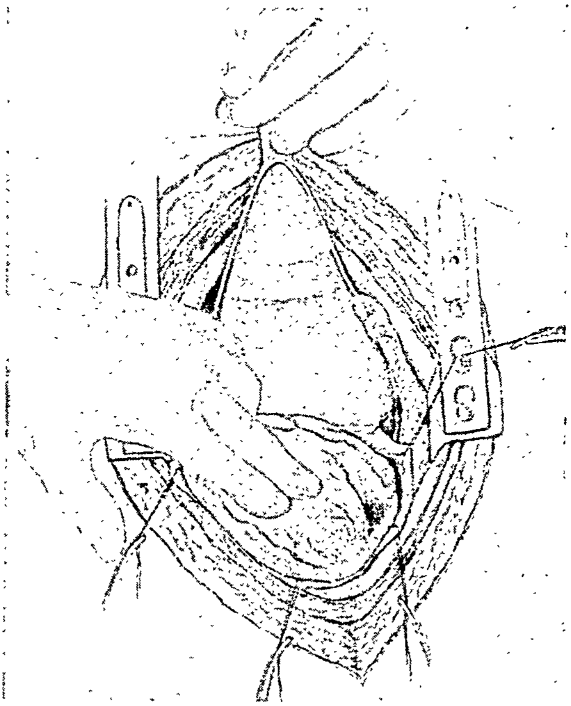


Fig. 6.—Apex elevated showing posterior aspect of heart.

If the pressure falls or if the heart rate is rapid or irregular, use of anesthetic is discontinued, and the lungs are well ventilated for several minutes. Mephentermine (Wyamine) in a dosage of 15 mg. is given intravenously for its pressor effect. Procainamide (Pronestyl) hydrochloride, in dosage of 50 to 100 mg., is given intravenously to reduce the irritability of the heart. A slow heart rate is preferable to a rapid rate, and atropine should be used only with caution. If the rate is 120 per minute or more, lanatoside C (Cedilanid), in a dosage of 0.2 to 0.4 mg., is given intravenously. It takes effect in about 20 minutes; often the rate falls abruptly to 80 per minute. During this waiting period the lungs are well ventilated. Quinidine sulfate, dosage 0.4 Gm. intravenously, is rarely used for frequent extrasystoles. The most effective way to take care of these is to reduce manipulation of the heart or to give it complete periods of rest or not to handle it at all.

Postoperative Care

The patient is conscious when the dressing is applied to the wound and when the intratracheal tube is removed. The patient is placed in semi-Fowler's position, given oxygen nasally, and kept in the recovery room for about five hours. Glucose solution is given intravenously, but the needle is removed after several hours. After return to his room, the patient sits up and dangles his legs or sits in a bedside chair. Sedation is kept to a minimum. Coughing and arm movements are encouraged. On the next day the patient stands on his feet for about 30 minutes, three times. The physiotherapist takes over for exercises the first day after operation and continues for one week. On the second day the tube is removed from the chest. Use of antibiotics and digitoxin is discontinued after one week. One, sometimes two, x-rays of the chest are taken after operation. Discharge from the hospital occurs on the 10th to the 14th day after operation.

The complications are few. In one patient the heart began to fibrillate and stopped beating four hours after operation. This occurred in the recovery room, which is near the operating room. One of us (C. S. B.) was operating on another patient when it occurred. He immediately left the operation, opened the chest while the patient was in the recovery room, pumped the heart for 35 minutes, and shocked the heart out of fibrillation; the patient is alive with no mental deficit and little or no anginal pain two years later. In several other patients fibrillation occurred, but the heart beat could not be restored. In these we tried unsuccessfully to clean out a coronary artery. Other complications were an embolus to an arm, and this embolus was successfully removed; mesenteric thrombosis occurred, and the artery was cleaned out, but it clotted again and the patient died. Complications have been few.

Early Observations After Operation.—The sedative effects of the surgical procedure are passed off by the second or third day. At this time when the patient is asked how he feels, he usually states that his chest hurts and points to the incision. When asked how his heart feels he usually states "It feels alright; I have not noticed that I have a heart; it feels free and looser; it isn't tight." How about pain? "I have not had any of the old heart pain; my arm feels better, and I feel warmer." This type of early report occurs in the majority of patients. Before discharge from the hospital the patient is allowed to try himself out on two or three flights of stairs. To the patient and to us doing this work, the reaction of the patient to exercise is most gratifying.

On discharge from the hospital the patient is told not to expect too much because his disease has not been cured, that after increased physical exertion he may have some pain, that he should not hesitate to take a glyceryl trinitrate pill for it, and that his improvement will continue over a period of several months.

Mortality.—Mortality depends to some extent on the type of patient selected for operation. If operation were applied only to patients in the terminal stages of this disease the mortality would be prohibitive. On the other hand, if it were applied only to patients with slight disease, the mortality would be zero or almost zero. Our policy is not to aim at zero mortality, because in achieving such a record patients who need help and who could be rehabilitated to a work-status would be denied operation. One-third of our patients have advanced disease as determined by examination of arteries and muscle at the time of operation. These patients are classified as salvage.

From Jan. 1, 1954, to Feb. 14, 1958, the Beck operation was done on 347 patients. These were consecutive operations done at University Hospitals and at Mount Sinai Hospital, Cleveland. During the period of hospitalization the total mortality was 21, or 6%. The total mortality after discharge from the hospital during a period of somewhat more than four years was 32, or 9.2%. Within this series were 100 consecutive operations with zero operative mortality, and in the subsequent series of 100 cases there were four patients who died, making the mortality 2% in 200 consecutive cases.

In the 110 salvage cases the hospital mortality was 11%, and the subsequent mortality was 15% for a total of 26%. In the 234 nonsalvage cases the hospital mortality was 3%, and the subsequent mortality during the four-year period was 7% for a total of 10%. There were three patients not classified. In the nonsalvage cases, the risk of operation is small and the life span appears to be excellent. In patients with coronary heart disease this record emphasizes the desirability of early operation. The death factor in the early stages of the disease is electric imbalance, and operation is especially designed for this factor.

Clinical Results

Relief of Pain.—Relief of pain is experienced within a few days after operation. Even at operation the heart is less irritable toward the end of the procedure than when it was first touched. A scratch on the skin to mark the incision becomes a band of red within a few moments. Similar changes are, no doubt, possible in the heart, and the heart is extremely responsive to any changes in blood supply.

A survey of clinical results was completed recently. In this series of 347 patients, 295 patients are now living. Each of these was contacted. Two hundred seventy-eight of these patients, 94%, received an excellent result (32%) or a good result (62%). The definition of an excellent result is applied to those who are completely or almost completely free of pain and have taken no medicaments since operation. The definition of a good result is applied to those patients who are improved after operation but who have an occasional pain and who take significantly less medicaments than before operation. The results in the 73 living patients classified as salvage are almost as good as those obtained in the other group. The percentage of excellent results, 22%, is less, but the percentage who received improvement was as high or even higher than in the other group. Because of this we believe the restrictions for acceptance of patients for operation should be as broad as possible, even though it involves increased mortality.

The patients herein analyzed have had the experiences of medical treatment first and surgical operation later. These patients, therefore, can compare the relative merits of medical and surgical therapy. The superiority of surgical versus medical treatment is in about the same proportion as measured in the laboratory or about five to one in favor of surgical operation. Furthermore, the surgical result is permanent while the drug-effect is transient. Many of the patients were disappointed with medical therapy and were critical of their professional care, in that operation had been delayed or that the patient had even been advised not to have the operation done. This reaction by the patients was intensified by the knowledge that medicaments fail to produce intercoronaries and that all they were receiving from the medication was transient relief of pain. To these patients this is not enough.

Increased Capacity for Work.—Almost all patients are able to go back to their previous jobs or are able to do some kind of gainful work. Some of the patients were completely incapacitated for work before operation, and others were not so incapacitated. With many a patient the anatomy in the heart is good and the anginal pain is comparable to an incapacitating toothache and the result of operation is comparable to that after extraction of the tooth. To be freed from incapaciting anginal pain is scarcely a figment of the patient's mind.

Cold Feet Before Operation; Warm Feet After Operation.—Many patients stated that their feet were warmer after operation. A study of foot temperatures was carried out.[4] Twenty-three patients were studied who had cold feet before operation. In 21 of these the temperatures after operation rose 4 to 5 C. The greatest rise was 10 C in one patient and 8 C in each of two others. If the temperatures were normal before operation, they remained normal after operation. What is the significance of warming of cold feet? First, this is an objective measurement which must be accepted as fact. Physiologically it means that the circulation to the feet is improved by operation on the heart; more blood has reached the feet. The mechanism is not known, but presumably it is by release of spasm.

Many patients state that the entire body is warmer. Some of the patients stated that their memory is improved and that they can comprehend conversation better. Releasing of cerebral spasm is not to be dismissed as an impossibility.

Absent Radial Pulse Before Operation and Return After Operation.—The radial pulse in the left arm disappeared when a patient had an occlusion of a coronary artery. Blood pressure could not be obtained in this arm, and the pulse was absent for one year when operation was done on the heart. Two days after operation it was noticed that the pulse was present and the blood pressure in the left arm was the same as in the right arm. The obvious explanation of this is that the disease produced arterial spasm of a large artery elsewhere in the body and that this spasm was released by operation on the heart. In terms of physiology it is significant, first, that this relationship existed and, second, that the surgical operation was effective in releasing it.

Irregularities of Heart Beat Before Operation; Disappearance After Operation.—In 20 patients operated on, chronic arrhythmia was the most prominent and important symptom before operation. These arrhythmias in most of these patients were distressing and alarming. In 17 patients the arrhythmias either completely disappeared or they diminished in frequency and severity after operation.[5] This is presented as objective evidence of benefit from operation.

Improvement in Ballistocardiogram After Operation.—Ballistocardiograms were done on 17 consecutive patients operated on. In 13 of these the record was abnormal; in 3 it was normal. Significant improvement in the record occurred after operation in 11 of the 13 patients who showed abnormal records before operation.[6] in two, the record did not change. The improvement in the ballistocardiogram indicates improved contractility of the myocardium. This study is presented as objective (not subjective) evidence of benefit from operation.

Summary and Conclusions

Blood supply to ischemic muscle is the primary consideration in the physiology and treatment of coronary heart disease. The relative effectiveness of glyceryl trinitrate and of surgical operation has been studied. The problem of treatment is selection of the most effective method for the three disease factors. These are electric imbalance, inflow reduction, and muscle destruction. The first of these yields to surgical treatment.

Results, including mortality, subjective improvement, and objective measurements, were studied in 347 consecutive patients. The fact that cold feet be'ore operation become warm after operation indicates improved circulation in far away parts of the body. The physiology involved here deserves more han passing consideration. This objectivity together with the clinical results (plus a firm foundation rom the laboratory) should help to prove that the peration is nothing less than an effective and beneficial procedure.

2065 Adelbert Rd. (6) (Dr. Beck).

This work was supported by grants from the United States ublic Health Service and the Cleveland Area Heart Society.

Figures 1 and 2 are reproduced with permission from the urnal of Thoracic Surgery (36:329-351 [Sept.] 1958).

References

1. Beck, C. S., and Leighninger, D. S.: Operations for oronary Artery Disease, J. A. M. A. **156**:1226-1233 (Nov. ') 1954; Scientific Basis for Surgical Treatment of Coronary rtery Disease, ibid. **159**:1264-1271 (Nov. 26) 1955. Beck, C. S.: Coronary Artery Disease—Physiologic Concepts—Surgical Operation, Ann. Surg. **145**:439-460 (April) 1957; Coronary Artery Disease: Report to William Harvey 300 Years Later, Am. J. Cardiol. **1**:38-45 (Jan.) 1958; Coronary Heart Disease: Evaluation and Criticism of Present Day Concepts, editorial, ibid. **1**:547-552 (May) 1958; Coronary Heart Disease: Three Dominant Causes of Death, Am. J. Surg. **95**:743-751 (May) 1958.

2. Brofman, B. L., and Beck, C. S.: Coronary Heart Disease: Hemodynamic Principles and Their Therapeutic Applications, J. Thoracic Surg. **35**:232-254 (Feb.) 1958.

3. Hahn, R. S., and Beck, C. S.: Revascularization of Heart: Study of Mortality and Infarcts Following Multiple Coronary Artery Ligation, Circulation **5**:801-815 (June) 1952.

4. Baumgartner, D. A., and Nevin, J. E.: Changes in Peripheral Circulation in Lower Extremities Following Beck 1 Operation for Coronary Heart Disease, Am. J. Cardiology, to be published.

5. Brofman, B. L.; Bond, J. F.; and Leighninger, D.: Influence of Beck Operation on Chronic Arrhythmias Associated with Coronary Heart Disease, to be be published.

6. Brofman, B. L.; Arbeit, S. L.; and Adicoff, A.: Ballistrocardiographic Evaluation in Surgical Treatment of Coronary Heart Disease, Am. J. Cardiology, to be published.

* * *

YOUR MALPRACTICE INSURANCE CONTRACT

Howard Hassard, LL.B., San Francisco

Professional liability insurance contracts are not all the same. Individual contracts must be studied for possible gaps in coverage. The limitations and exclusions they contain are not a criticism of the insurance industry, for they determine whether an insurance company can stay in business. The physician should understand the insuring clause, monetary limits, exclusions, practice limitations, territorial limitations, settlement restrictions, the cancellation clause, and the extent of his duty to cooperate with the insurer. The basic reason for the need of cooperation is that the insurance carrier assumes a substantial monetary risk and, in return for it, is entitled not only to a premium but also to full and honest assistance from the insured physician. The gravest error is to purchase on the basis of price alone. Physicians should examine their current professional liability policies with these facts in mind.

Professional liability insurance does not cover all possible risks that are inherent in the practice of medicine. Even with high limits of coverage, medical society endorsement, or the assistance of a skilled broker, there may still be gaps in your contract. Accordingly, you must be aware of the major points to check before you buy.

Examination of Insurance Contract

The Insurance Carrier.—Know the other party to the contract: the insurance carrier. Some companies have a well-deserved reputation for liberal handling and not resorting to loopholes; others are noted for strict interpretation and resort to the fine print.

Seek companies that are well established and that have adequate reserves and unassigned surplus. A company with inadequate reserves or surplus may be inclined to seek loopholes if it faces a heavy loss and leave you, the physician, to face the plaintiff's lawyer alone and unprotected.

The insurance company should be subject to the laws of the state where you practice and subject to insurance department rules and regulations. In the

---

Read in the Session on Medical Professional Liability before the Section on Miscellaneous Topics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

event of a suit over the policy provisions or activities of the company, the state insurance department can be of material assistance without cost to the insured.

It is essential in the field of malpractice liability, because of latent liabilities, that the company not only has financial stability but has been in business long enough so that it can be reasonably expected to continue in business in the foreseeable future.

Differentiation of Terms.—Know what your contract with the insurance company contains and does not contain. Know the differences between company, broker, and agent:

The Company: A company or insurance carrier is the entity, usually a corporation, which is financially obligated under the insurance contract to carry out the provisions of the policy and to assume the defense and expense of any claims brought against the assured under the policy.

The Broker: A broker is one who is licensed to transact the business of insurance and who represents the buyer. He may place his business with any company, and in so doing he remains the agent of the buyer. You may look only to your broker and no one else in the event he fails to remit your premium to the company, secures improper coverage, or carelessly handles your needs.

The Agent: An agent is one who is licensed by an insurance company to transact the business of insurance. He represents the company which licenses him, and he binds that company by agency. In this instance, responsibility is in both the agent and the insurance company. A person may be both a broker and an agent, but generally he is one or the other.

The Underwriter: Another term frequently used is "underwriter." Legally, this means an insurer or company, but some brokers adopt the term as part of a trade name. This practice is confusing, and one must be alert to the fact that underwriter may only signify a broker.

What Malpractice Policies Contain

You should know what is in your policy and how it works. Malpractice policies contain these subjects: (1) insuring clause, (2) monetary limits, (3) exclusions, (4) practice limitations, (5) territorial limitations, (6) settlement restrictions, (7) cancellation clause, and (8) provision for duty to cooperate with the insurer at all times.

The Insuring Clause.—The insuring clause in the contract defines types of claims covered. There is no uniformity in this field—unlike, for example, fire and life insurance. The usual insuring clause, which reads "injury arising out of malpractice, error, or mistake in rendering or failing to render professional services," should be carefully analyzed. It may not cover assault, battery, breach of implied contract, libel and slander, and agreements guaranteeing the result of treatment, to specify some of the nonerror types of claim. You should read your contract carefully, with these questions in mind:

First, does your policy contain a provision to defend all claims and suits, including malicious prosecution, counterclaims and cross-complaints (which arise when suing to collect fees), and suits based on failure to act (omission), i. e., services you "should have rendered"?

Second, do you have coverage for personal restraint? This means false imprisonment (for instance, a claim may arise when helping a family cope with an acute psychiatric emergency).

Third, do you have coverage for undue familiarity? Take precautions; take your nurse on calls, and never examine alone if you have reason for suspicion.

Fourth, does your policy include coverage for assault and battery? Four per cent of all suits against physicians are not based on alleged malpractice but are predicated on a claim of assault and battery. Generally, such suits claim the surgeon operated without proper consent or went beyond consent given.

Fifth, what about implied contracts? You may be sued for breach of contract if your patient interprets your prognosis as a guarantee he will get well. Say nothing that will be interpreted as a promise to cure. Suing for breach of contract has become popular of late among plaintiffs' lawyers. It gets around necessity for an expert witness, but, also, it gets around your insurance unless your policy expressly covers contract claims.

Sixth, does your policy cover you in case of charge of libel or slander? A patient may claim violation of your duty to remain silent. The California Medical Practice Act states that willful betrayal of a professional secret is ground for revocation of license; it can also be the basis for a slander suit. Say or write nothing that will violate the privilege.

Seventh, is premise liability coverage included? This is important if you are the owner or lessee of premises. Sometimes it is difficult to determine whether a suit is for alleged malpractice or for premise liability—as when a patient falls in a treatment room. Use the same company for malpractice and premise liability. Split liability can involve a conflict between carriers and shifting of responsibility, e. g., a patient under narcotics slips on tile in waiting room—which policy covers it?

Before leaving the subject of scope of coverage, I cannot resist recounting an unusual happening. A doctor, while performing an orthopedic procedure in a hospital, caused the instrument to slip, badly injuring his physician assistant. The question was what insurance would protect the doctor from a claim or suit by the assisting physician?

His malpractice insurance actually did not apply, because this accident was not covered under the insuring clause which only covered injuries to patients while rendering professional services. His comprehensive personal liability did not apply, as professional services or business activities were excluded. His premise liability policy did not apply, as it was unrelated to the insured premises (i. e., his office). The hospital insurance did not apply, for it did not involve defective equipment. The doctor was completely dependent on a superliberal interpretation of his malpractice contract to cover the claim.

Monetary Limits.—How much insurance coverage do you have? Are your total limits measured by occurrence of accident or aggregate?

Are legal expenses included? With today's verdicts, \$100,000-per-\$300,000 coverage does not go very far. In California there have been several jury verdicts over \$200,000 and at least one settlement before trial in excess of \$250,000.

Exclusions.—Read your policy to be on guard as to what is not covered. The exclusions are usually plainly and unequivocally stated.

Are other people in your office covered? These include nurses, assistants, employees, and substitutes or *locum tenens*. I know it is not nice to mention it, but if a physician employs a "ghost" surgeon he may be uninsured, because some policies require the specific consent of the patient to the operator as well as to the operation. Also, are your partners insured? Suppose you are individually insured, and your partner is being sued and he dies; you are responsible for his acts as partner. Are you covered? It is wise to have partners covered in the same company and as partners, as well as individually.

Some of the routine exclusions are as follows: First, intoxication and drugs, the exclusion for which usually reads, "shall not pay . . . in suits based on services rendered while under the influence of intoxicants or drugs."

If you leave a cocktail party to answer an emergency call, are you covered? If you took barbiturates at bedtime and answered an emergency call, are you covered?

If your contract excludes acts or omissions "while under the influence of drugs or alcohol," strictly speaking you are not covered for damages if an "under the influence" charge is made and can be proved. "Under the influence" or "drunk" are not well-defined phrases. Different courts define both terms in different ways. "Under the influence" is a relative term embracing various degrees of intoxication and mental obscuration. Here are a few sample definitions:

> This condition presents various degrees of intensity, ranging from a simple exhilaration to a state of utter unconsciousness and insensibility. (*Paris v. Robinson,* 140 S. W. 434)
>
> The condition of a man whose mind is affected by the immediate use of intoxicating drinks. . . . Under the influence of intoxicating liquor to such an extent as to have lost the normal control of one's body and mental faculties, and, commonly, to evince a disposition to violence, quarrelsomeness and bestiality. (*Zee v. Gary,* 189 So. 34)
>
> When one's brain is so far affected by potations of liquor that his intelligence, sense perception, judgment, continuity of thought, or of ideas, speech, and coordination of volition with muscular action are impaired or are not under normal control. (*Wilson v. Inter-Ocean Cas. Co.,* 188 S. E. 102)

Second, unlawful or criminal acts are invariably excluded. Is this limited to acts you know to be wrong? What about innocent acts, or what if you are forced to take unlawful action by an emergency or physical compulsion of another?

What is an unlawful act? Is it any infraction, no matter how minor, or must it be a felony or a serious misdemeanor? Is the word "unlawful" synonymous with "criminal"?

How directly must the unlawful act be connected? An illegal abortion is clearly not covered, but how about plastic surgery on a criminal? Or, what if you employ an unlicensed person in your office? In one California case, years ago, the insurer denied liability in a case against a partnership of radiologists because they had employed a well-trained radiologist from Canada who was not yet licensed in California. The insurer said employment of unlicensed physicians is unlawful, we exclude unlawful acts, good bye.

Is all coverage lost by violation of this condition? Under one form of contract the physician loses both his defense costs and indemnity in the event a suit against him falls within the "unlawful acts" exclusion. Under another form of contract the insurance company must still defend the physician, even though unlawful acts are charged or found, but the physician is obligated to pay any judgment rendered against him.

It is essential that each physician know the effect of each and all of the exclusion clauses in his malpractice contract.

Practice Limitations.—There are two types of practice limitation found in malpractice insurance contracts. One type is an outright exclusion of certain procedures, e. g., fluoroscopy and anesthesia, unless a special added premium is paid; the other type is a classification of practice for determining a basic premium rate, i. e., general practice versus surgery.

Frequently, the application for insurance that must be signed in order to obtain a contract contains representations by the physician as to the scope and type of his practice. These representations may or may not be "warranties." If the application form becomes a part of the contract or uses language to the effect that the insurer may rely on the representations as warranties, it is possible that a mistake or omission by the physician in filling out the application form can result in a denial of liability by the insurer, if a claim arises. It is essential, therefore, that each physician carefully read and accurately answer the application, particularly those questions relating to the scope and type of practice, as well as questions relating to prior claims or suits.

The usual practice limitations found are anesthesiology, therapeutic radiology, and fluoroscopy. The usual basic premium rate differentials are between 100% nonsurgery, some surgery, and exclusively a surgical practice.

As long as the word "surgery" is understood, classification for rating purposes by the physician is not difficult. However, surgery may be defined differently in different insurance contracts. One contract, for example, defines both major surgery and minor surgery. Another contract classifies everything that involves puncturing, penetrating, or severing tissue as surgery.

Incidentally, the contract that classifies major surgery and minor surgery for rate purposes distinguishes between major and minor by listing specific procedures under each category. The physician must carefully read the entire list in order to be certain that he properly classifies himself.

Territorial Limitations.—Many malpractice insurance contracts exclude coverage while the insured is outside the United States and its territories. Some policies include Canada, but no other foreign country. If you travel abroad be sure and check your malpractice contract in advance, because even emergency treatment rendered outside the United States could result in a lawsuit for which you would be uninsured.

Settlement Restrictions.—Most professional liability insurance contracts provide that the insurance company may not settle a claim or suit without the consent of the insured physician. This is a most important provision for the protection of the physician. Inasmuch as professional liability claims involve professional reputations as well as money, it is of paramount interest to the insured physician that he have control over the disposition of a claim made against him. Some professional liability contracts omit this provision and allow the insurance carrier to settle claims without the consent of the physician. A few contracts contain a built-in booby trap; it is this:

The contract contains the usual provision that settlement may not be made without the consent of the insured physician, but then a sentence follows providing that, if the physician refuses to approve a settlement offer and the case is then tried and lost, the insurance coverage is automatically limited to the amount of the settlement offer. In other words, a physician may refuse to settle, but if he does so he acts at his own risk and automatically reduces the amount of his coverage to the amount of the tendered settlement.

Cancellation Clauses.—Practically all professional liability insurance contracts permit either party to cancel at any time; usually 10 or 30 days' written notice of intent to cancel is required. A few group programs have protection against wholesale cancellation by agreement with the group carrier; however, this is the exception rather than the rule. Most physicians in the United States are currently insured for professional liability under contracts that can be canceled in not more than 30 days.

Duty to Cooperate with Insurer.—The typical professional liability policy contains the following clause: "The insured shall cooperate with the company, and, on the company's request, shall attend hearings and trials and shall assist in effecting settlements, securing and giving evidence, obtaining the attendance of witnesses, and in the conduct of suits. . . . The insured shall not voluntarily make any payment, assume any obligation, or incur any expense at his own cost, without the consent of the company previously given in writing."

Various contracts will use variations of the foregoing language, but all in effect require the insured physician to cooperate with the insurer in the defense of any claim or suit.

Cooperation includes prompt notice to the insurance carrier whenever an incident occurs that could give rise to a liability claim; cooperation requires that the insured physician not undertake to handle the matter himself; and cooperation requires that the physician not "build" a claim in conjunction with his patient for the purpose of securing compensation from the insurance carrier. Such activity can result in the insurance carrier denying liability because of the physician's breach of the cooperation clause.

The basic reason for the contract provisions requiring that the physician cooperate with and assist his insurer is that the insurance carrier assumes a substantial monetary risk, and in return for this risk it is entitled not only to a premium but also to full and honest help and assistance from the insured physician.

Another facet of the cooperation clause is the usual contract provision that the insured physician shall neither admit liability nor attempt to make a settlement on his own account. It is most important to remember that in all liability insurance contracts the insured has no right to give away the insurer's money.

Comment

Professional liability insurance contracts are not all the same. They differ in many respects and are almost as individualistic as women's hats. It is never safe to purchase professional liability coverage without reading and understanding the contract, on the assumption that it will protect you no matter what happens. In fact, even the broadest professional liability policy contains exclusions and limitations. Have your policy provisions interpreted by a person experienced in professional liability insurance who can relate the insurance clauses to the practice of medicine. Few people in the insurance business or in the legal profession have had sufficient experience in the medical malpractice field to properly apply policy terms to a medical practice.

For example, assault and battery is generally interpreted as a physical assault, whereas in malpractice it is, in addition, interpreted to include failure to obtain a proper consent to a treatment or operation or failure to inform a patient of any change in the original scope of the surgery to be performed.

The gravest error is to purchase on the basis of price alone. When a physician is threatened with a professional liability suit, he desperately needs the aid and assistance of expert claims adjusters and counsel—to say nothing of the need to protect his property. The penny-wise pound-foolish purchaser who bought the cheapest contract and did not read it may discover when his need arises that he is not covered; or he may find that he is covered but has a contract that permits the insurance carrier to compromise or settle without his consent or that he has a contract with a five-day cancellation clause which is immediately exercised.

The fact that professional liability insurance contracts contain exclusions and limitations is not a criticism of the insurance industry. An insurance company to stay in business must at least break even; no business can survive for long if it pays out more than it takes in. The insurance business is highly competitive; the purchasers of insurance pick and choose; and when the buyers want price economies the insurance carriers have no choice—to stay in business they must compete price-wise, and to compete price-wise they must limit their liability. No one can change this basic law of economics.

Conclusions

I hope that this paper may stimulate those physicians who hear or read it to examine their current professional liability policies, and to determine—through inquiry to their carriers if necessary—the acts or omissions for which they are covered or not covered, and the limitations and other provisions that may take away coverage if the physician's behavior is contrary to the contractual commitment. It is better to know in advance than to find out after it is too late.

111 Sutter St. (4).

EXPERT WITNESS AND ADVISORY PANELS

Joseph F. Sadusk Jr., M.D., Oakland, Calif.

The difficulty involved in obtaining expert medical testimony from physicians in personal injury cases is well known. It is due not to his unwillingness to cooperate with the law but rather to the fact that he is cast into an atmosphere foreign to his training and philosophy. The physician is trained as a scientist to present medical data and conclusions in a narrative and factual manner and to elaborate on the pros and cons of the medical problem. Due to the adversary system of trial in the United States, this is not generally possible. Under such a system, the physician replies to a series of questions which, when put by an experienced trial attorney, may modify, twist, and distort the true medical story.

A milestone was reached in 1952 when the justices of the Supreme Court of the County of New York encouraged the local bar associations and medical societies to embark on a system for impartial medical testimony in personal injury cases.[1] The success of this project led to a permanent continuation of the procedure, and similar or identical plans will doubtless appear in other parts of the United States.

Except for an initial pilot plan pioneered by the Los Angeles County medical and bar associations several years ago, there has been little or no at-

It is difficult to obtain expert medical testimony from physicians in personal injury cases. This is not due to unwillingness to cooperate with the law but rather to the fact that the physician is cast into an atmosphere foreign to his training and philosophy. A plan has been formulated to make available a panel of physicians for consultation with attorneys of the local or neighboring bar associations for presuit expert opinion and, where suit is instituted, for testimony as an expert witness. The education of physicians to serve on these professional liability medical panels is considered of paramount importance. This is accomplished through a thorough indoctrination by a joint committee of the local medical and bar associations, with or without the assistance of special statewide indoctrination committees where such assistance is considered desirable and necessary by the local working units. The success of these panels will depend on the professional qualifications and impartiality of the panel physicians and the willingness and readiness of attorneys to accept a neutral and unbiased opinion.

Member, Committee on Medicolegal Problems, American Medical Association.

Read in the Session on Medical Professional Liability before the Section on Miscellaneous Topics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

tempt to solve the problems of expert medical advice and testimony in the field of medical malpractice, a small but nevertheless important segment of personal injury litigation. Here the natural disinclination for the physician to testify is compounded by the fact that he must advise and testify against a colleague—a fellow physician—whom he may see week in and week out. Such reluctance is natural and understandable. The law and organized medicine have long been aware of this problem, but it remained for the California Medical Association and the State Bar of California to simultaneously agree to investigate and confer on the solution of the availability of impartial medical expert witnesses in alleged medical malpractice cases.

As a result of the 1955 meeting of the Conference of California State Bar Delegates, a committee was appointed to study the problem of obtaining evidence in malpractice cases. Meetings were held with representatives of the California Medical Association to explore the situation, after which the Board of Governors of the California State Bar and the Council of the California Medical Association appointed comparable committees to meet in joint session to formulate a plan which would make available to attorneys the services of qualified physicians to advise on a case of alleged malpractice and, if suit were instituted, to testify as an expert witness. In September, 1957, these committees recommended to their respective parent organizations the plan presented here.[2]

The Plan

The purpose of the plan is to form a panel of physicians available for consultation with attorneys of the local or neighboring bar associations for presuit expert opinion and, where suit is instituted, for testimony as an expert witness. Such a panel would be used only for cases of alleged medical malpractice.

Selection of panels would be on an appointment basis by the medical societies within each territorial district, with approval of the panel by the board of directors of the applicable local county bar association.

Disqualification of a panel member would occur if he is treating or has ever treated or consulted on the plaintiff patient or if there is a relationship, business or otherwise, between the panel member and the defendant physician.

The panels would include members from general practice, from the following basic specialty areas of medical malpractice, and from such additional areas of specialty practice as shall be determined within each district: (1) medicine, (2) surgery, (3) obstetrics and gynecology, (4) pediatrics, (5) pathology, and (6) radiology.

Administration of a panel would be by a designated officer of the local county bar association, with names on file.

A panel member would be called by the complainant's request in writing to a physician on a panel list as submitted by the local bar association. The physician then notifies his county medical society and the local bar association in writing of the requested consultation, giving name of attorney, complainant, and physician complained against.

Education of a panel would be accomplished by a series of lectures from a joint committee of local medical and bar association members or by special statewide indoctrination committees.

For the consultation and examination, review of records, preparation of report, and testimony, the physician receives the reasonable value of his time in accordance with the prevailing fees in his community.

No reference may be made in court to the panel or medical or bar associations' participation therein. Judges are requested to adopt a rule forbidding counsel (on each side) to mention the status of the witness in relation to the panel.

A panel physician who consults with or examines a complainant may not, without the consent of the complainant, be examined in a civil action as to any information acquired from the complainant which was necessary to enable the physician to prescribe or act for the complainant, except as provided below.

A complainant may secure additional examinations or consultations from the panel list, but only if the complainant agrees in writing, with the preceding panelist consulted, that the latter may be examined in any civil action based on the complaints involved.

A complainant may secure an examination or consultation with a second member of the over-all panel without being required to waive the confidential nature of the first examination or consultation, providing the initial panelist selected reports in writing to the administrative officer of the local county bar association that the complaint is not within his area of practice or that a second examination or consultation is necessary or advisable for the stated cause.

The "Ground Rules" of the Plan

This plan was approved by the governing bodies of the parent organizations in September, 1957. The committees then met again to outline and to recommend certain "ground rules" to the individual medical societies and county bar associations of California, at which level the plan was to be implemented. Further, it was made clear that these working units were free to modify the plan to meet local conditions and attitudes and, indeed, the local county and bar units were free to accept or reject the entire concept of such panels. These basic "ground rules" were as follows:

Panel members are to be appointed by the county society, not selected from volunteers. Only those panel appointees who have attended the indoctrination lectures are eligible to serve. Present members of public service or malpractice committees of county societies are not eligible for service on the panel. Panel appointments are for one year only; a new panel is appointed each year, but the same physicians are eligible year after year. Panel members, as such, are available to complainants against doctors of medicine only. In each county, the panel should be representative of the practice of medicine in that area as to specialties and general practitioners. The financial arrangements between the complainant's attorney and the panel member are to be by agreement between them, although a fee scale may be established by the county medical society if it so desires. Fees are to be paid in advance unless otherwise agreed between the panel member and the attorney.

Specific Instructions for the Physician

The education of physicians to serve on these professional liability medical panels was considered of paramount importance, to be accomplished through a thorough indoctrination by a joint committee of the local medical and bar associations, with or without the assistance of special statewide indoctrination committees where such assistance is considered desirable and necessary by the local working units. Specific instructions are to be sent to each physician panel member with his obligations clearly outlined along the following lines.

Notification of State and County Bar and Medical Associations.—The physician will be instructed to immediately notify the respective organizations by completion of a special form in quintuplicate, of which he will retain one copy and mail the remaining four copies to the California Medical Association. This organization will assume the responsibility for distribution of the copies to the county bar and medical associations and to the California State Bar. This notification is considered necessary to insure the adherence of attorneys to the rule of the formulated plan which provides for written waivers by the complainant or his attorney when securing additional medical opinions from the panel. In addition, these reports will insure that the panel member's rights will be protected by the bar and medical associations. Further, analyses will be made as the years go along to evaluate and to improve the program.

Instructions for Thorough Study of All Medical Factors.—The necessity for a thorough and impartial review of the case before the physician expresses an opinion is to be emphasized to the physician, wherein he is to examine the patient, and to review all available evidence including hospital records, x-rays, laboratory reports, and other medical records and data which can reasonably be obtained before rendering a report.

Report of Opinion and Testimony.—The physician will be required to submit his report to the plaintiff's attorney in writing covering history of the injury, the patient's account for treatment and its results, findings on examination of the injured part or parts and notation of abnormalities, indications if another field of medicine outside the physician's field is involved, the extent of injuries and conclusions as to degree of disability, and, finally, an opinion as to whether or not the defendant doctor deviated from the legal requirement of "standard and accepted medical practice." It will be the physician's duty to testify in court as to his opinion if the case goes to trial.

Objective and Impartial Attitude.—The physician will be advised to not become an advocate for either side but rather to evaluate the facts objectively and render an impartial opinion.

Promptness in Rendering Reports.—The physician will be impressed by the fact that undue delay in reporting to the plaintiff's attorney may prejudice the interests of either or both the complainant and the doctor complained against.

Disqualification of Panel Physician.—The panel physician is to be disqualified if (1) he has treated or is treating the complaining patient or has been consulted by representatives of the physician, (2) there are personal or other relations with the patient which might prejudice the physician's opinion, (3) there is a business or a personal relationship between the panel physician and the defendant physician which would make it impossible to render an impartial opinion, (4) the medical problem is not within the field of practice of the panel physician, and (5) the nature of the case or other commitments would make it impossible for the physician to devote the time necessary for a full study of the case.

Comment

It is to be emphasized that this plan for a professional liability medical panel has not yet reached the working stage. These panels are presently being set up throughout the major population areas of California where agreed to by both local county medical and bar associations. Modifications and changes will doubtless be required as time goes along with experience gained by attorneys and physicians in the use of the panel.

The success of these panels will depend on the professional qualifications and impartiality of the panel physicians and the willingness and readiness of attorneys to accept a neutral and unbiased opinion. That organized medicine and the law has reached such an agreement speaks for the willingness of both parties to serve the administration of justice.

459 30th St. (9).

References

1. Special Committee of the Association of the Bar of the City of New York: Impartial Medical Testimony, New York, the Macmillan Company, 1956.

2. West, F. E., and Archer, J. W.: Medical Expert Panels for Malpractice Cases, California Med. **88**:173-175 (Feb.) 1958.

CLINICAL NOTES

ASYSTOLE COMPLICATING ACUTE MYOCARDIAL INFARCTION

SURVIVAL WITH THE AID OF A CARDIAC PACEMAKER AND INTRAVENOUS ADMINISTRATION OF ISOPROTERENOL

Sylvan D. Solarz, M.D., David M. Berkson, M.D.
and
Alfred Pick, M.D., Chicago

Since the development by Zoll[1] of an external cardiac pacemaker capable of producing effective ventricular contractions by transthoracic electric stimulation many cases of asystole have been successfully treated with the aid of this device alone or in combination with intravenous administration of isoproterenol (Isuprel) hydrochloride.[2] The majority of the reported cases have been those of chronic atrioventricular block with Stokes-Adams disease. Recently we had opportunity to apply this regimen to a patient in whom an advanced second degree atrioventricular block with Stokes-Adams attacks developed acutely in the course of a myocardial infarct. (The term "advanced second degree atrioventricular block" is applied to cases in which several successively dropped beats initiate atrioventricular nodal escape and dissociation with or without ventricular captures.[3]) To our knowledge this is the first such case with survival treated in this manner. Continuous monitoring of the rapidly changing cardiac mechanism in conjunction with automatic release of the pacemaker when needed permitted prompt adjustments of the therapy according to instantaneous needs and an immediate evaluation of the effect each new procedure had on the cardiac rhythm. We used a unit consisting of an external cardiac pacemaker, a cardiac monitor with both visual and auditory signals of each ventricular beat, and a cardioscope with continuous display of an electrocardiographic tracing. After a predetermined asystolic period the pacemaker automatically goes into action, and an alarm is sounded. External electric impulses continue at a preselected rate and strength until the machine is turned off manually. This type of action serves to bring instant attention to the patient and to shorten the period of asystole.

Report of a Case

A 58-year-old female was admitted to Michael Reese Hospital on May 8, 1958, with the complaint of severe substernal pain. The patient had been under the care of one of us (S.D.S.) for five years because of coronary heart disease with anginal syndrome and congestive heart failure. She had been well maintained on therapy with digoxin (Lanoxin), chlorothiazide (Diuril), and glyceryl trinitrate. Previous electrocardiograms (fig. 1, *1953*) were relatively stable over the years and showed a first-degree atrioventricular and a right bundle-branch system block without evidence of myocardial infarction. The evening prior to admission the patient experienced substernal pain relieved by glyceryl trinitrate; however, later that night she was awakened from her sleep by severe chest pain requiring narcotics for relief.

On admission the pertinent physical findings were as follows: pulse 84 beats per minute and regular; blood pressure 140/70 mm. Hg bilaterally; thyroid gland slightly enlarged to palpation; the lungs clear; the heart size normal; the second aortic sound of normal intensity and louder than the second pulmonic sound; a grade 1 systolic murmur heard over the base of the heart; the liver not palpable and no signs of congestion.

Admission laboratory data included the following findings: hemoglobin level 13.4 Gm.; white blood cell count, 21,300 per cubic millimeter, with 85% polymorphonuclear cells, 11% lymphocytes, and 4% monocytes; sedimentation rate, 17 mm. per hour (Wintrobe); fasting blood sugar level, 168 mg.%; serum urea nitrogen level, 28 mg.%. The serum transaminase on May 8 was 24 units, and on May 9 it had risen to 73 units. The electrocardiogram (fig. 1, *5-8-58*) revealed, as previously, sinus rhythm with first-degree atrioventricular and right bundle-branch system block and, in addition, contour changes characteristic of acute posterior wall infarction. Initial therapy included bed rest, oxygen tent, anticoagulation with heparin and warfarin (Coumadin), and digoxin.

The patient did well for the first 24 hours. On May 9 an intermittent pulsus bigeminus was noted, and another electrocardiogram was taken. This showed sinus rhythm with incomplete atrioventricular dissociation due to a second-degree atrioventricular block with repetitive nodal escapes (fig. 2, 5-9) and further contour changes suggesting extension of the infarction to the lateral wall. The average ventricular rate was 60 per minute, and the blood pressure was unchanged. The patient remained in good clinical condition, and on the following day the heart rate was regular. On May 11 a pericardial friction rub was noted, and shortly thereafter the blood pressure fell precipitously, moist rales and hepatomegaly developed, and the clinical condition deteriorated rapidly. An intravenous-infusion of arterenol, 2 ampuls (16 mg.) in 1,000 cc. of 5% dextrose in water, was started immediately, and the patient received additional digitalis and a mercurial diuretic. The blood pressure promptly rose to satisfactory levels. An electrocardiogram (fig. 2,

---

From the Department of Medicine and the Cardiovascular Department of the Medical Research Institute, Michael Reese Hospital.

5-11) revealed irregularity and marked slowing of the ventricular rate to an average of 35 per minute due to a more advanced atrioventricular block with a complex mechanism[4] and signs of continued extension of the infarction. On May 12, because of a persistent slow ventricular rate, isoproterenol therapy, 10 mg. sublingually every four hours, was started. In spite of this there were several momentary lapses of consciousness, and the isoproterenol dosage was increased to 15 mg. On this medication the ventricular rate rose to 50 and became almost regular. An electrocardiogram (fig. 2, 5-12) showed sinus rhythm with a 2:1 atrioventricular block, alternating with periods of atrioventricular dissociation during which an accelerated ventricular pacemaker operated at about half the sinus rate. However, on the morning of May 13, an episode of ventricular asystole with convulsions and cyanosis occurred, and the patient appeared moribund. After vigorous pounding of the precordium the heart resumed beating. Isoproterenol, 0.2 mg., was given intramuscularly immediately, and the automatic external pacemaker was attached to the patient with the release time set at three seconds of asystole. The isoproterenol injection was repeated within the next hour but failed to prevent frequent periods of ventricular standstill. Each asystole brought the automatic pacemaker into action, with prompt restoration of spontaneous heart beats. A constant intravenous drip of isoproterenol was then begun, with 2 mg. per 500 cc. of 5% dextrose in water at an initial rate of 15-20 drops per minute corresponding to approximately 4 mcg. per minute.[2] After several periods of asystole leading to pacemaker discharge, it was found that 60 volts was adequate to produce ventricular contractions. Electrocardiograms between asystolic periods (fig. 3, *upper strip*) showed an irregular ventricular rate because of atrioventricular conduction ratios varying between 2:1 and 5:1, with ventricular escapes terminating those pauses which were not long enough to bring the external pacemaker into action. One of the longer ventricular pauses, with nine successively blocked P waves, leading to automatic discharge of the pacemaker and subsequent resumption of the original mechanism, is illustrated in the lower strip of figure 3.

From May 13 until the afternoon of May 15 the patient was kept on the regimen of treatment with intravenously given isoproterenol with the pacemaker constantly attached to the chest. During this period the predominant rhythm was a second-degree atrioventricular block with varying atrioventricular ratios. As the rate of the infusion was slowed, ventricular pauses became longer and caused discharge of the pacemaker. As the infusion rate was increased, shorter ventricular pauses were terminated by nodal or ventricular escapes, but in addition several brief paroxysms of auricular fibrillation and of ventricular tachycardia were observed on the cardioscope early on May 13 (fig. 2, *5-13*). Late that evening it was noted that the ventricular rate was slowing and numerous episodes of asystole occurred requiring pacemaker stimulation. It was necessary to increase the voltage and the number of successive shocks to overcome the periods of ventricular standstill. Increase in the rate of flow of isoproterenol failed to prevent ventricular pauses, but bizarre ventricular complexes of variable contour appeared, progressively increasing in frequency, and eventually a continuous ventricular tachycardia developed. After five minutes of this rhythm the patient appeared moribund. At this point it was decided to replace the isoproterenol infusion by procainamide (Pronestyl) hydrochloride in an attempt to convert the rhythm; 50 mg. was given cautiously. This caused slowing of the ventricular rate and reappearance of a few supraventricular beats. The administration of an additional 75 mg. led to a ventricular standstill. Repeated shocking by the external pacemaker caused resumption of the original supraventricular rhythm, and the isoproterenol infusion was restarted at a reduced rate of flow. Several minutes later, paroxysmal ventricular tachycardia again appeared. It was stopped by another 100 mg. of procainamide which was followed by protracted ventricular arrest and then restitution of intrinsic ventricular activity by external electric stimulation.

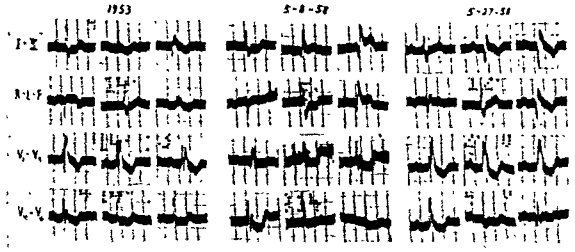


Fig. 1.—Three 12-lead electrocardiograms showing development (*1958*) of characteristic features of posterolateral wall infarction on top of a preexistent right bundle-branch system block (*1953*).

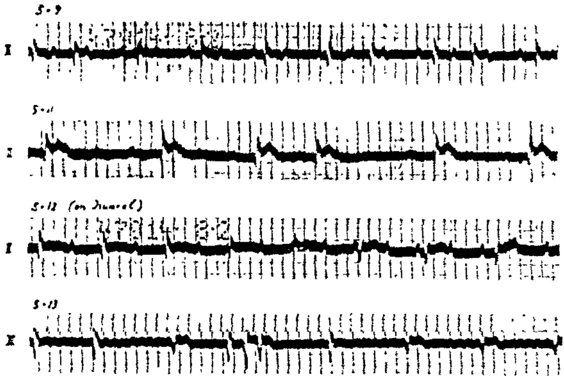


Fig. 2.—Electrocardiograms representative of variety of mechanisms encountered: Intermittent ventricular bigeminy as result of second-degree atrioventricular block with nodal escapes (*5-9*). Marked slowing of ventricular rate as result of more advanced atrioventricular block (*5-11*). Consequent to isoproterenol (Isuprel) medication, 2:1 atrioventricular conduction changing to atrioventricular dissociation with accelerated ventricular pacemaker (*5-12*). Paroxysm of auricular fibrillation with complete atrioventricular dissociation, alternating nodal and ventricular pacemakers, and short burst of ventricular tachycardia (*5-13*).

Because of this difficulty in controlling the rhythm, the concentration of isoproterenol was changed to 2 mg. per 750 cc. of 5% dextrose in water. In addition, on May 14, the arterenol infusion was discontinued. Throughout this day and thereafter the blood pressure remained constant. There were several episodes of asystole promptly terminated by the external pacemaker, and in the afternoon the rhythm became stabilized with second-degree atrioventricular block and spontaneous nodal or ventricular escapes. On the afternoon of May 15, the atrial action changed from sinus rhythm to fibrillation but the average ventricular rate remained 40. Slowing or speeding up of the isoproterenol infusion altered neither the atrial mechanism nor the ventricular rate. It was decided to stop the infusion to determine whether the ventricular rate would be maintained spontaneously. At first ectopic ventricular beats increased in frequency, and after 15 minutes asystole occurred long enough to cause discharge of the external pacemaker. Immediately after this, the auricular fibrillation reverted to sinus rhythm with second-degree atrioventricular block and a constant ventricular rate of 40. This was the last episode of asystole requiring external stimulation. On May 16 the atrioventricular block varied between first and second degree, and from May 17 on first-degree atrioventricular block became permanent (fig. 1, 5-27-58). The remainder of the hospital course was uneventful, signs of congestive heart failure gradually disappeared, and the patient was discharged on June 29, 1958. At the time of writing (August, 1958) she is following the usual course of recovery from a myocardial infarction of this severity.

Comment

The prognosis of advanced atrioventricular block complicating recent myocardial infarction has recently been reviewed by Cohen, Doctor, and one of us.[5] They found the over-all immediate (two-month) mortality in a series of 68 cases to be 47%, the death rate increasing with the severity of the block. Posterior wall infarcts accounted for 75% and carried an immediate mortality of 37%, whereas in anterior wall infarcts 75% of patients died. In 32 of 36 surviving cases, atrioventricular block was transient. The long-term prognosis of those surviving the first two months was not affected by the temporary conduction disturbance. Therefore, it appears that if a patient survives the initial complication of atrioventricular block his chances for long-term survival are as good as those of one with an uncomplicated myocardial infarction. From an anatomic viewpoint it would appear that patients with a transient block have ischemia or edema involving the conduction system whereas actual necrosis of these tissues is present in cases with permanent conduction defects. From the clinical standpoint one cannot distinguish between these two possibilities during the acute episode, the time when adequate therapy is of the utmost importance. It is in line with this that recently the successful use of adrenal steroids in cases of acute myocardial infarction with Stokes-Adams attacks has been reported.[6]

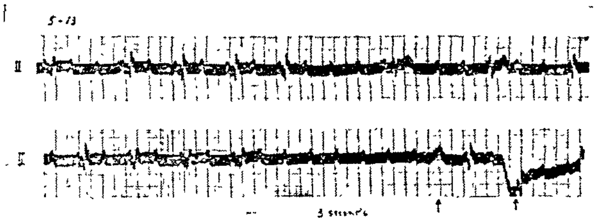


Fig. 3.—Consecutive portions of long record showing termination of ventricular pause by spontaneous ventricular escape (*upper strip*) and longer pause terminated by two automatic discharges of external pacemaker (*arrows*) initiating intrinsic ventricular impulse formation (*lower strip*).

While it is realized that each case of this nature requires individual measures which might not be applicable to others, in our case it is believed that the recovery is to be attributed not to a single agent or medication but rather to the awareness of impending attacks of asystole, to the proper preparations for handling such an event, and to the alertness of the members of the house staff assigned to this case.

The appearance of a bigeminal rhythm on auscultation early in the course of the patient's illness first brought to mind the possibility of second-degree atrioventricular block with 3:2 conduction. It has been our experience that bigeminy occurring in the course of acute posterior wall infarction is more often due to this latter mechanism than to ectopic impulse formation.[3] The electrocardiographic confirmation of the atrioventricular conduction disturbance alerted us to the possibility of its progression to Stokes-Adams attacks, although there was no clinical evidence of this at that time. As the degree of block increased isoproterenol medication was started sublingually, and the external pacemaker was kept nearby, ready for immediate use.

In order to maintain spontaneous intrinsic ventricular activity we had the choice of three sympathomimetic drugs: arterenol, epinephrine, and isoproterenol. At the time of the first syncope, the patient had been receiving arterenol intravenously constantly for about 48 hours and at that time was unable to maintain her blood pressure without it. The fact that such attacks occurred while the patient was receiving this drug is in keeping with its known pharmacological effects which do not include enhancement of nodal or ventricular pacemaker action. With regard to the two other agents, it has been found by Zoll and his co-workers[2] in comparative studies that, in patients with high blood pressure, isoproterenol might be preferable to epinephrine since it has no vasopressor action. On the other hand, epinephrine is the drug of choice when the pressure is normal or low. Furthermore, they state that epinephrine should be used in patients who, prior to the attacks, had functioning atrioventricular conduction "since it is a much less potent accelerator of the sinoatrial pacemaker than is isoproterenol and there is, accordingly, less risk of a rapid ventricular rate should atrioventricular conduction return." In our patient, however, the blood pressure had to be maintained artificially and it was felt that this should be done independently of the attempt to control ventricular activity. We were aware of the fact that the amount of the drug determining the ventricular rate might have to be varied from moment to moment and thus new problems might arise should control of blood pressure and ventricular activity depend on the same medication. For this reason isoproterenol and arterenol were used simultaneously.

After the first convulsion, the isoproterenol medication was changed from sublingual to intramuscular administration and the automatic external pacemaker was attached to the patient. This arrangement prevented the occurrence of further seizures, but it soon also revealed that isoproterenol per se was inadequate to prevent protracted periods of asystole, even after its administration by continuous intravenous drip. On the other hand, the continuous infusion of isoproterenol probably was responsible for the prompt resumption of spontaneous ventricular activity after one or two external electric shocks (fig. 3, *lower strip*), as was consistently noted on the cardioscope. The external pacemaker functioned as a stimulator of intrinsic mechanisms rather than as a substitute for spontaneous ventricular activity.

Therapeutic effects of isoproterenol consisted in stimulation of impulse formations in supraventricular and ventricular centers as well as in improvement of conductivity of the atrioventricular junction (fig. 2, *5-12*). This twofold action of the drug has been pointed out previously by us [7] as well as by others.[8] Toxic effects, on the other hand, caused by too rapid infusion consisted in undue acceleration of ventricular impulse formation culminating in almost fatal attacks of ventricular paroxysmal tachycardia which required procainamide medication. Whether or not the paroxysms of auricular fibrillation are to be ascribed to the isoproterenol medication is unanswered. Of considerable theoretical interest is the abrupt termination of auricular fibrillation on one occasion (May 15) by external electric stimulation.

The initial recommended concentration of isoproterenol for intravenous infusion (4 mcg. per cubic centimeter) [2] was found to provide too small a margin between therapeutic and toxic levels. This has also been our experience in other cases of patients with Stokes-Adams disease treated by isoproterenol in this hospital. More dilute solutions, for instance 3 mcg. per cubic centimeters, proved easier to handle and seemed to enhance the safety margin, although it still was difficult to regulate the dose of the medication. Nevertheless, the rapid disappearance of the effects of the diluted drug seems to reduce the dangers of this mode of administration provided constant observation is maintained. The latter is greatly aided by the continuous use of a cardioscope, which was an integral part of the procedure used in this case.

Summary and Conclusions

Survival of a patient with recent posterior wall infarction complicated by frequent attacks of ventricular asystole, as a consequence of a progressively advancing atrioventricular block, is attributed to the prompt and systematic use of an intravenous infusion of isoproterenol in combination with an automatic external pacemaker.

Success or failure of treatment of such cases largely depends on early recognition of impending syncope, on adequate preparations for handling of such an event, and on continuous monitoring of therapeutic measures by a cardioscope. The earliest clinical sign of impending asystole may be the development of a bigeminal pulse.

Recent myocardial infarction complicated by asystole may require the simultaneous use of two sympathomimetic agents: arterenol to maintain the blood pressure and isoproterenol to insure an adequate rate of ventricular contraction. Isoproterenol given as an intravenous infusion is not a harmless drug, and its overdosage may lead to dangerous, rapid ectopic rhythms of ventricular origin. The proper dose may vary from case to case and from moment to moment and requires adjustments under close and continuous observation on a cardioscope.

2011 E. 75th St., (49) (Dr. Solarz).

The external cardiac pacemaker unit used in this study was Electrodyne model PM65, manufactured by the Electrodyne Co., Norwood, Mass.

This study was supported in part by the Hibse Heart Fund for Cardiovascular Research and the Michael Reese Research Foundation.

References

1. Zoll, P. M.: Resuscitation of Heart in Ventricular Standstill by External Electric Stimulation, New England J. Med. **247**:768-771 (Nov. 13) 1952.

2. Zoll, P. M., and others: Intravenous Drug Therapy of Stokes-Adams Disease: Effects of Sympathomimetic Amines on Ventricular Rhythmicity and Atrioventricular Conduction, Circulation **17**:325-339 (March) 1958.

3. Katz, L. N., and Pick, A.: Clinical Electrocardiography, Part I: Arrhythmias, with Atlas of Electrocardiograms, Philadelphia, Lea & Febiger, 1956.

4. Langendorf, R., and Pick, A.: Supernormal Phase of Atrioventricular Conduction, abstracted, Proceedings of Third World Congress of Cardiology, Brussels, 1958, p. 343.

5. Cohen, D. B.; Doctor, L.; and Pick, A.: Significance of Atrioventricular Block Complicating Acute Myocardial Infarction, Am. Heart J. **55**:215-219 (Feb.) 1958.

6. Phelps, M. D., Jr., and Lindsay, J. D., Jr.: Cortisone in Stokes-Adams Disease Secondary to Myocardial Infarction: Report of Case, New England J. Med. **256**:204-208 (Jan. 31) 1957.

7. Pick, A., and Lichtman, A.: Effects of Isuprel in Advanced A-V Block, abstracted, Circulation **16**:925-926 (Nov.) 1957.

8. Schaub, F.; Holzmann, M.; and Wyss, S.: Zur Behandlung von Adams-Stokesschen Anfällen und Überleitungsstörungen des Herzens mit Isopropylnoradrenalin, Schweiz. Med. Wchnschr. **87**:938-946 (July) 1957.

CHLOROTHIAZIDE (DIURIL) AS A HYPERURICACIDEMIC AGENT

Benjamin G. Oren, M.D., Maurice Rich, M.D.
and
Martin S. Belle, M.D., Miami, Fla.

Chlorothiazide (Diuril) has been recently introduced into therapeutics, first, as an effective nonmercurial diuretic[1] and, more recently, as a potentiating hypotensive agent in the treatment of essential hypertension.[2] It apparently has proved to be quite effective in these actions but has a tendency to cause excessive excretion of sodium, potassium, and chloride.[3]

Recently, we noted that in some patients unexplained joint pains could occur, especially in the feet, during the use of this drug. Investigations show no organic cause for this symptom, but the uric acid levels in the blood were found to be elevated. Further investigation of a number of patients receiving this drug confirmed this observation, though joint and foot pain was by no means a uniform symptom. Indeed, some of the highest uric acid levels were associated with no joint pain whatever.

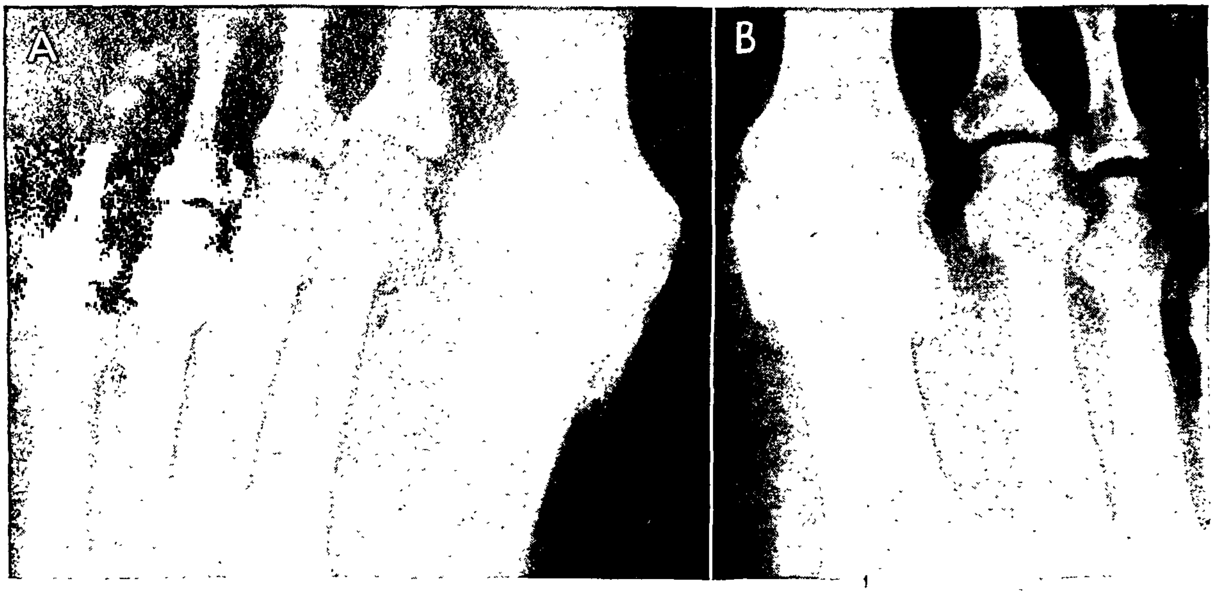
Two significant cases are reported below.

Report of Cases

Case 1.—A 44-year-old man had been under treatment for essential hypertension for three years, at first with Rauwolfia, subsequently with reserpine (Serpasil). He had suffered a coronary thrombosis two and one-half years ago. It was necessary for him to take 3 mg. of reserpine or its equivalent in order to attain an adequate normotensive effect. However, this large amount of drug resulted in considerable depression and an annoying sluggishness which made it difficult for the patient to continue with his therapy. Accordingly, one year ago associated therapy with chlorothiazide was begun, with smaller doses of reserpine. He was given 500 mg. of chlorothiazide twice daily with 0.25 mg. of reserpine twice daily. This resulted in an adequate control of blood pressure and a return of his mood to normal.

Within three months after institution of this therapy, the patient began to note unusual fatigue and especially pain in the feet on walking and at rest. This was a generalized aching discomfort in both feet. Various attempts to relieve the pain were instituted, including contrast baths, strapping, and various types of shoes, all without much benefit. X-rays showed no evidence of arthritis, tophi, or other organic bone or joint disease. The blood uric acid level was 6.8 mg. % (normal 3 to 5 mg. %). A few days thereafter the chlorothiazide therapy was discontinued, and another uric acid determination 10 days after cessation of the therapy was 4.1 mg. %. The foot pains had disappeared a few days after the discontinuation of chlorothiazide therapy.

Because of the need to control the hypertension, chlorothiazide therapy was again started on Feb. 1, 1958. Within two weeks the aching in the feet had recurred. A blood uric acid determination on June 2, 1958, was 6.6 mg. %. On June 5, chlorothiazide therapy was discontinued. Another determination of uric acid level was made on June 13, at which time it had returned to the normal value of 4.3 mg. %. Again the foot pains had disappeared.



Roentgenograms of both feet in case 2. Note, A, destruction of metatarsophalangeal joint space in right foot.

Clinical Associate Professor of Medicine (Dr. Oren) and Clinical Assistant Professor of Medicine (Drs. Rich and Belle), University of Miami School of Medicine.

Case 2.—A 46-year-old man was seen on May 6, 1954, with a history of unexplained hematemesis and melena requiring transfusions in 1950 and another episode of milder hematemesis in April, 1954. He seemed to be in good general physical condition. His blood pressure was 160/110 mm. Hg, and he was somewhat overweight. Gastrointestinal studies showed a minimal deformity of the duodenal bulb, and it was felt that previous episodes of hemorrhage had been from duodenal ulcer. The patient's blood pressure dropped to 110/90 mm. Hg on treatment with Rauwolfia. He got along well on medical therapy, but his blood pressure rose to 170/115 mm. Hg as he discontinued use of medicaments.

On Jan. 16, 1958, he was started on chlorothiazide therapy, 500 mg. twice daily, and reserpine, 0.25 mg. twice daily. The blood pressure thereupon promptly returned to 130/80 mm. Hg, and his weight dropped during the next six months from 197.5 to 166 lb. (89.6 to 75.3 kg.). He felt unusually well except that he began to note increasing pain in the right great toe with prominence at the base of the distal phalanx of the right metatarsal. When seen on Sept. 11, 1958, this had the appearance of gout; the joint was tender and swollen but not hot. On questioning, the patient recalled that he had been told several years previously that he had slight arthritis in the right great toe with small "punched-out areas" appearing on x-ray. Roentgenograms were taken showing destruction of the base of the metatarsophalangeal joint of the right great toe with osteophyte formation (see figure). It was felt that these changes were the result of gouty arthritis. The blood uric acid level was 6.5 mg. %. Chlorothiazide therapy was discontinued, and 12 days later the uric acid level had dropped to 5.4 mg. The pain, swelling, and tenderness in the joint had disappeared, and the patient was asymptomatic. The blood pressure remained at 120/80 mm. Hg.

Comment

The use of chlorothiazide is becoming increasingly prevalent as its hypotensive potentiating effect becomes more clearly established. It seems that in addition to its effect in depleting sodium and potassium levels, this drug has still as yet an unexplained apparent effect on the kidneys, causing them to retain uric acid. Of course, another possible explanation might be an increased catabolism of nucleic acids induced by the drug, but this does not seem likely. Further investigations will probably determine the exact mechanism of action.

This side-effect has hitherto been alluded to only once, by Laragh and his associates.[3a] They noted a significant elevation of serum uric acid level in six of eight patients studied, varying from 7.6 mg. % to 11.5 mg. %. The effect could not be attributed to dehydration, since the blood urea level was not concurrently elevated. In all instances of hyperuricacidemia the patient was asymptomatic and the uric acid level returned promptly to normal values on cessation of therapy.

Our observation confirms those of Laragh and others,[3a] but the uric acid level seems to be even more consistently elevated in patients taking chlorothiazide for any length of time. All 12 patients studied in our group revealed significant elevation of blood uric acid levels, ranging from 6.3 to 10 mg. %. Only three of these patients had joint pains in the feet, and only one (case 2) had positive x-ray findings.

We cannot be sure that true gout is actually caused by this elevation of uric acid level, but it appears that gout-like symptoms can be produced in certain individuals and that the intensity of this effect is not necessarily in direct ratio to the height of the uric acid level in the blood. It is not unlikely that those patients who develop joint pain are potentially gouty individuals in whom symptoms have merely been precipitated. Certainly so valuable an agent as chlorothiazide should not be discarded because of this or other side-effects described thus far. The purpose of this preliminary communication is merely to call attention again to the prevalence of hyperuricacidemia with its use and also to indicate that gout-like symptoms may occur in certain patients. Therefore, we feel that those patients who have a history of gout should be watched with especial care. Further study may clarify the mechanism of this side-effect.

1431 N. Bayshore Dr. (36) (Dr. Oren).

References

1. Ford, R. V.; Moyer, J. H.; and Spurr, C. L.: Clinical and Laboratory Observations on Chlorothiazide (Diuril): Orally Effective Nonmercurial Diuretic Agent, A. M. A. Arch. Int. Med. **100**:582-596 (Oct.) 1957. Becker, M. C.; Simon, F.; and Bernstein, A.: Clinical Evaluation of Chlorothiazide as Diuretic Agent in Congestive Heart Failure, J. Newark Beth Israel Hosp. **9**:58-67 (Jan.) 1958. Pfeiffer, P. H.: Chlorothiazide, Nonmercurial Diuretic Agent, J. Maine M. A. **49**:55-56 (Feb.) 1958.

2. Freis, E. D.; Wanko, A.; Wilson, I. M.; and Parrish, A. E.: Treatment of Essential Hypertension with Chlorothiazide (Diuril): Its Use Alone and Combined with Other Antihypertensive Agents, J. A. M. A. **166**:137-140 (Jan. 11) 1958. Freis, E. D., and Wilson, I. M.: Potentiating Effect of Chlorothiazide (Diuril) in Combination with Antihypertensive Agents: Preliminary Report, M. Ann. District of Columbia **26**:468; 516 (Sept.) 1957. Hollander, W., and Wilkins, R. W.: Chlorothiazide: New Type of Drug for Treatment of Arterial Hypertension, Boston M. Quart. **8**:69-74 (Sept.) 1957. Wilkins, R. W.: New Drugs for Hypertension, with Special Reference to Chlorothiazide, New England J. Med. **257**:1026-1030 (Nov. 21) 1957. Heider, C.; Dennis, E.; and Moyer, J. H.: Chlorothiazide Potentiation of Ganglionic Blockade in Patients with Hypertension, Ann. New York Acad. Sc. **71**:456-464 (Feb. 3) 1958.

3. (*a*) Laragh, J. H.; Heinemann, H. O.; and Demartini, F. E.: Effect of Chlorothiazide on Electrolyte Transport in Man: Its Use in Treatment of Edema of Congestive Heart Failure, Nephrosis, and Cirrhosis, J. A. M. A. **166**:145-152 (Jan. 11) 1958. (*b*) Beyer, K. H.; Baer, J. E.; Russo, H. F.; and Haimbach, A. S.: Chlorothiazide (6-chloro-7-sulfamyl-1, 2, 4-benzothiadiazine-1, 1-dioxide): Enhancement of Sodium Chloride Excretion, Fed. Proc. **16**:282 (March) 1957. (*c*) Ford, R. V., and Spurr, C. L.: Electrolyte Excretion Patterns due to Chlorothiazide, New Orally Effective Diuretic Agent, abstracted, Am. J. Med. **22**:965 (June) 1957.

COUNCIL ON DRUGS

Report to the Council

The Council has authorized publication of the following report. Nonproprietary terminology is used for all drugs that are mentioned; when such terminology is not considered to be generally well known, its initial appearance is supplemented by parenthetic insertion of names known to be applied to commercial preparations. H. D. KAUTZ, M.D., *Secretary.*

CURRENT STATUS OF THE TREATMENT OF ADRENAL DISORDERS

George W. Thorn, M.D., Don H. Nelson, M.D.
and
Albert E. Renold, M.D., Boston

The availability of precise diagnostic techniques and the synthesis of several important adrenal cortical steroids provide the practicing physician with an unusual opportunity for establishing a correct diagnosis and initiating appropriate therapy in patients with abnormalities of adrenal cortical function. The ever-widening horizon of the nonspecific use of adrenal steroid therapy and the exploration of the beneficial effect of hypophysectomy and adrenalectomy have increased greatly the numbers of patients with evidence of altered adrenal cortical function. The development of accurate and clinically applicable measurements of catechol amine levels in blood and urine has enhanced the accuracy with which pheochromocytoma may be detected and has provided a new and important screening technique which should be applied to all patients with hypertension of undetermined origin.

Hormone Preparations

The structural formulas of the adrenal steroid compounds are represented in figure 1.

Corticotropin.—Corticotropin (Acth, Lyophilized Acthar, Corticotropin, Lyophilized Corticotropin), also known as ACTH, adrenocorticotrophin, and corticotrophin, is available as a lyophilized powder, containing 10 to 40 U.S.P. units per vial for intravenous infusion or for intramuscular injection when dissolved in saline solution. Corticotropin is also available as a solution in gelatin, containing 20 to 100 "clinical units" per cubic centimeter, or in combination with zinc as corticotropin-zinc hydroxide (Cortrophin-Zinc) for intramuscular administration only. These preparations provide prolonged activity (18 to 36 hours) after a single intramuscular injection. "Clinical units" are equivalent approximately to one-third U. S. P. units. A U. S. P. unit equals 1 I. U., which, in turn, represents the biological activity of 1 mg. of corticotropin International Standard, as determined by measurement of the adrenal ascorbic secretion in the hypophysectomized rat.

In diseases of adrenal origin the use of corticotropin is confined largely to diagnostic procedures and for stimulating the adrenal cortex after prolonged steroid therapy. The administration of corticotropin, given intramuscularly and particularly intravenously, may precipitate a crisis in a patient with adrenal cortical unresponsiveness unless the patient is protected by the simultaneous administration of a cortisone-like steroid.

Cortisone-like Steroids.—The cortisone-like steroids, also known as 17-hydroxysteroids, are listed as follows.

Hydrocortisone (Cortef, Cortisol, Cortril, Hycortole, Hydrocortone): Hydrocortisone is available in solution in 50% ethyl alcohol, 100 mg. per 20 cc., and as hydrocortisone sodium succinate (Solu-Cortex), 134 mg. of this compound being equivalent to 100 mg. of hydrocortisone for intravenous or intramuscular injection. It is also available as the acetate in saline suspension for intramuscular use (25 mg. per cubic centimeter) and as 20-mg. tablets for oral use. Hydrocortisone, especially the succinate ester, is the only preparation available for immediate and rapid intravenous use. Conversely, the absorption of hydrocortisone acetate after intramuscular injection is much slower than cortisone and hence should be used only when a prolonged effect from a single injection is desired.

Cortisone (Cortisone, Cortogen, Cortone): Cortisone is available as the acetate in saline suspension (25 and 50 mg. per cubic centimeter) for intramuscular use and in tablets for oral use (5, 10, and 25 mg.). For all practical purposes cortisone and hydrocortisone are equivalent milligram for milligram.

From the departments of medicine, Harvard Medical School and the Peter Bent Brigham Hospital (Drs. Thorn, Renold, and Nelson) and investigator, Howard Hughes Medical Institute (Dr. Nelson).

Prednisone (Deltasone, Deltra, Meticorten) and prednisolone (Delta Cortef, Hydeltra, Meticortelone): Prednisone and prednisolone are available as 2.5-mg. and 5-mg. tablets for oral use. One milligram of prednisone or prednisolone is equivalent to 4 to 5 mg. of cortisone or hydrocortisone. Prednisone and prednisolone exert much less sodium-retaining effect, milligram for milligram, than does cortisone or hydrocortisone.

Triamcinolone (Aristocort, Kenacort): Triamcinolone is available as 4-mg. tablets for oral use. One milligram of triamcinolone is equal to approximately 6 mg. of cortisone or hydrocortisone. This substance, milligram for milligram, possesses even less sodium-retaining effect than does prednisone or prednisolone.

Fludrocortisone (Alflorone, F-Cortef, Florinef): Fludrocortisone is available as the acetate in 0.1-mg. and 1.0-mg. tablets. This derivative of hydrocortisone is approximately 25 times as active as cortisone, hydrocortisone, and desoxycorticosterone (Cortate, Decortin, Decosterone, Doca, Percorten); hence, its sodium-retaining action is very great in relation to its cortisone-like action.

Sodium-Retaining Adrenal Steroids.—All adrenal steroids are "sodium-retaining" to some extent under normal conditions. However, unless very large doses of cortisone, hydrocortisone, and prednisone are employed, this activity is not prominent.

Fludrocortisone: Fludrocortisone, as noted previously, is an extremely active sodium-retaining hormone, 1 mg. by mouth being equivalent to 25 mg. of desoxycorticosterone given by injection.

Desoxycorticosterone: Desoxycorticosterone is available for intramuscular injection as the acetate in sesame oil (5 mg. per cubic centimeter). For prolonged effect (15 to 30 days), it is available as a suspension of the trimethylacetate ester (25 mg. per cubic centimeter) and as the acetate in 2-mg. and 5-mg. buccal tablets for sublingual use.

Aldosterone: Aldosterone, the naturally occurring sodium-retaining hormone in man, is not available commercially.

Special Considerations.—The high potency of fludrocortisone, in respect to both its cortisone-like effect and its sodium-retaining effect, makes the administration of this substance particularly advantageous when adrenocorticotropin tests are being carried out. Patients with suspected Addison's disease can be given 1 to 2 mg. of this substance daily while the tests are being conducted, without concern for the hormone derived from this substance which may appear in the urine, since the quantity is so small. Furthermore, larger doses of this substance may be substituted in patients on prolonged cortisone therapy in whom it is desirable to test reserve adrenal capacity before hormone therapy is reduced or discontinued. Thus, 4 to 5 mg. of fludrocortisone is equivalent to 100 mg. of cortisone or hydrocortisone. However, the dietary sodium should be rigidly restricted during the period of substitution to avoid excessive sodium retention. Supplementary potassium chloride (3 to 6 Gm. daily) may also be given.

Acute Adrenal Crisis

Such an emergency may be precipitated in a patient with chronic adrenal cortical insufficiency by the superimposition of stress, such as intercurrent infection, surgery, or trauma. It may also be precipitated in patients on long-term, large-dosage cortisone therapy by the sudden withdrawal of hormone therapy or by the superimposition of stress without an accompanying increase in steroid therapy. Acute adrenal crisis may occur as a complication of anticoagulant therapy (hemorrhage into the adrenal gland) or may present itself as shock in conjunction with surgery, hemorrhage, or acute infection. *It is nearly always impossible to establish* with certainty the diagnosis of acute adrenal crisis at the time a patient presents the picture of acute hypotensive shock.

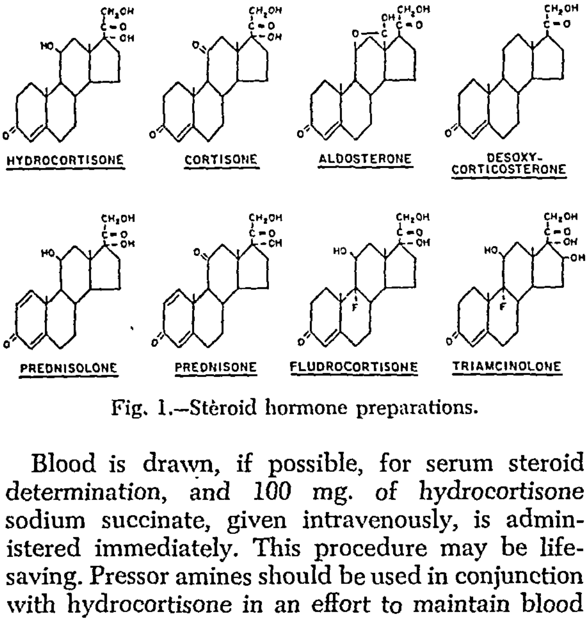


Fig. 1.—Steroid hormone preparations.

Blood is drawn, if possible, for serum steroid determination, and 100 mg. of hydrocortisone sodium succinate, given intravenously, is administered immediately. This procedure may be lifesaving. Pressor amines should be used in conjunction with hydrocortisone in an effort to maintain blood pressure. The use of whole blood, plasma, or albumin and electrolyte solutions given intravenously will be dictated by the circumstances surrounding the circulatory collapse.

If the diagnosis appears to be confirmed by the initial response of the patient to therapy, by the blood steroid values, or by history, then an intravenous drip containing 1,000 cc. of 5% dextrose in isotonic sodium chloride solution, to which is added another 100 mg. of hydrocortisone sodium succinate, is continued, and 100 mg. of cortisone acetate is injected intramuscularly. With the termination of the intravenous infusion, the patient is given 50 mg. of cortisone acetate intramuscularly or orally every 8 hours for the subsequent 24 hours, then every 12 hours for the next 24 hours, and then a total of 50 to 75 mg. per day by mouth in two or three divided doses or intramuscularly by injection. During this period, in conjunction with the large doses of hydrocortisone and cortisone plus isotonic sodium chloride solution given intramuscularly, no salt-retaining hormone is necessary. When the dose of cortisone is reduced below 75 mg. daily, the use of supplementary saline solution or a salt-retaining hormone, either desoxycorticosterone acetate intramuscularly or fludrocortisone orally, may be required.

Chronic Primary Adrenal Cortical Insufficiency, Including Addison's Disease

A definitive diagnosis of adrenal cortical insufficiency should not be made until a lack of response to intravenously administered corticotropin has been demonstrated, since in the presence of certain abnormal states, such as sarcoid and rheumatoid arthritis, intramuscularly administered corticotropin may not reach the adrenal cortex in adequate concentration. One may follow the urinary steroids or the blood steroid values. The authors prefer the former as being, in general, a more reliable measure of adrenal cortical reserve. The response to corticotropin is also useful in differentiating primary adrenal insufficiency from that secondary to pituitary failure (fig. 2). Blood corticotropin values will be elevated in untreated patients with primary adrenal cortical insufficiency and low or absent in those with pituitary insufficiency.

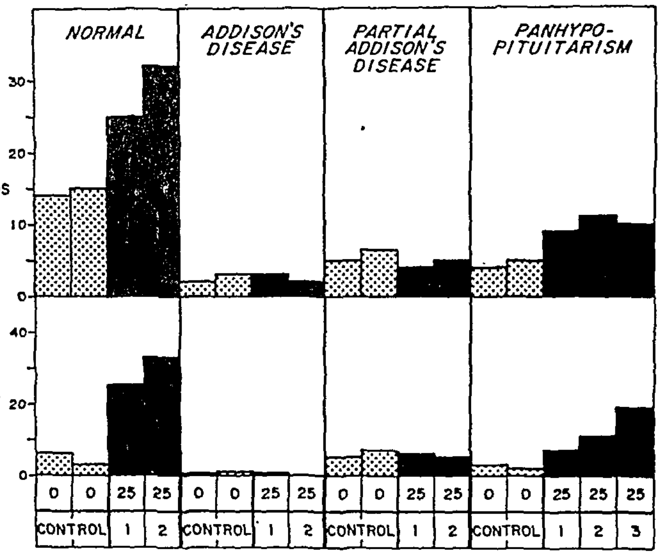


Fig. 2.—Response to intravenously given corticotropin in adrenal insufficiency.

Hormone therapy is indicated in any patient with impaired adrenal cortical reserve who exhibits weakness, weight loss, gastrointestinal symptoms, hyperpigmentation, fasting hypoglycemia, hypotension, abnormal electroencephalographic tracing, or in whom an abnormal response to a water load may be demonstrated. All patients with chronic adrenal deficiency will exhibit improved biochemical and physiological response to stress when given cortisone or one of its derivatives. Whether supplementary sodium chloride or a salt-retaining hormone is required in addition, and how much, will be determined by the patient's blood pressure, cardiac status, serum sodium and potassium levels, hematocrit value, and changes in body weight. The authors prefer to use a small dose of salt-retaining hormone in most patients with Addison's disease unless increasing age, with a rise in blood pressure, or renal and cardiac changes contraindicate.

Cortisone or hydrocortisone by mouth provides the basic maintenance therapy in a dosage of 25 to 50 mg. daily. For most patients one-half to two-thirds of the daily dose is given on arising, the remainder late in the afternoon. Supplementary hormone (50 to 100 mg. daily) is given in the presence of infection or unusual stress. If nausea or vomiting occurs, cortisone may be given intramuscularly; in an acute crisis, the intravenous administration of hydrocortisone is mandatory, as outlined in the foregoing section. The presence of healed or active tuberculosis is no contraindication to cortisone therapy, although the authors limit the maintenance dose to 20 to 25 mg. per day in conjunction with chemotherapy. Under the circumstances, the usual maintenance dose is well tolerated and may even accelerate recovery of the patient.

Adequate cortisone therapy should induce a regression of pigmentation and a gain in weight; hypoglycemic manifestations should be controlled; and a normal diuresis after a water load should be evident. Abnormalities in the electrocardiogram and electroencephalogram should disappear. Initially, chronically deficient patients may exhibit euphoria and an undesirable psychological response to cortisone, so that a dose not exceeding 12.5 mg. per day may be all a patient can comfortably tolerate. Later the dose may be increased slowly to 25 mg., without untoward symptoms. Patients with preexisting peptic ulcer may experience difficulty in tolerating 25 mg. daily of cortisone or its equivalent. In the rare combination of diabetes mellitus and adrenal cortical insufficiency, it is preferable to use a normal maintenance dose of cortisone (25 to 37.5 mg. daily) and sufficient insulin to maintain normal glucose levels. It is desirable for these patients to take part of their cortisone late at night or very early in the morning.

Most patients with chronic adrenal cortical insufficiency will be on maintenance therapy with cortisone or hydrocortisone. There is no advantage n using a preparation which is less salt-retaining, . e., prednisone or triamcinolone. In fact, for a few atients, cortisone or hydrocortisone alone with a generous dietary sodium intake may avoid the necessity of supplementary sodium-retaining hormone.

Most patients will do better on a small dose of sodium-retaining hormone. For this purpose, one has three choices: (1) fludrocortisone acetate by mouth in a single daily dose of 0.1 to 0.2 mg.; (2) desoxycorticosterone acetate in oil, the daily intramuscular dose being 1 to 5 mg.; or (3) desoxycorticosterone trimethylacetate, a monthly intramuscular injection of 25 to 75 mg. At a dose level of 0.1 to 0.2 mg. daily, the cortisone equivalent of fludrocortisone can be disregarded, i. e., it will not amount to more than 5 mg. of cortisone equivalent or hydrocortisone equivalent. If larger quantities of *fludrocortisone are required, i. e., 0.5 mg. or more,* then the cortisone equivalent of this sodium-retaining compound must be considered.

The majority of the authors' patients are on maintenance therapy with either 0.1 to 0.2 mg. of fludrocortisone administered orally daily or 25 to 50 mg. of the long-acting desoxycorticosterone ester given intramuscularly every two to four weeks. Because of the ease with which the oral administration of fludrocortisone can be manipulated, there is a growing tendency to substitute this therapeutic regimen for the monthly injections of long-acting desoxycorticosterone derivatives. Desoxycorticosterone acetate, with a duration of action of 12 to 24 hours, is a useful preparation for a patient who is experiencing nausea, vomiting, or diarrhea in which maximum sodium retention is desirable and in which oral medication may not be well tolerated. A dose of 5 to 10 mg. daily (1 to 2 cc.) of the oil solution given intramuscularly will ensure adequate sodium retention in the presence of normal kidney function. In all instances, it is desirable to establish the optimum dose of sodium-retaining hormone by carefully following changes in body weight, blood pressure, heart size, and serum sodium and potassium levels.

In summarizing, the condition of the majority of patients with primary chronic adrenal cortical insufficiency will be well maintained on a program which includes 25 to 50 mg. daily of cortisone or hydrocortisone and 0.1 to 0.2 mg. of fludrocortisone by mouth. In the presence of complications, the dose of cortisone should be increased immediately.

Chronic Secondary Adrenal Cortical Insufficiency (Hypopituitarism)

In the presence of anterior pituitary deficiency, adrenal cortical insufficiency is modified in three essential respects. First, pigmentation is unusual, due presumably to the fact that corticotropin and melanocyte-stimulating hormone are not present in increased quantities. Secondly, the manifestations of adrenal cortical insufficiency may be tempered significantly by concomitant thyroid and gonadal deficiencies. And thirdly, since corticotropin does *not exert the same primary control over aldosterone* secretion as it does in the case of the adrenal 17-hydroxysteroids, sodium deficiency may be less pronounced or nonexistent, a fact consistent with relatively normal urinary aldosterone values in patients with pituitary insufficiency. For practical purposes, one treats adrenal, thyroid, and gonadal deficiencies simultaneously in chronic anterior pituitary deficiency. One could employ corticotropin in these patients, but the practical disadvantages of a daily intramuscular injection of hormone favor the use of cortisone or hydrocortisone given orally. The doses of thyroid and cortisone are advantageously increased or decreased simultaneously, as the patient's cortisone require*ment may increase with an increased dose of thy*roid. Sodium liothyronine (Cytomel), also known as sodium L-triiodothyronine, may have an advantage over thyroid extract or thyroxin in some patients. The dose of cortisone or hydrocortisone in patients with chronic pituitary insufficiency is generally somewhat less than that for patients with Addison's disease. However, in the presence of unusual stress, a large supplement of cortisone will be required.

Iatrogenic Adrenal Insufficiency

Patients who receive prolonged steroid therapy for diseases such as rheumatoid arthritis, disseminated lupus, pemphigus, and asthma may develop temporary or even permanent adrenal cortical inhibition. Presumably the action of the steroids is to depress the hypothalamic-pituitary system. Withdrawal of hormone therapy may precipitate a relapse of the underlying disease, or, if adrenal function is severely inhibited, it may precipitate an acute adrenal crisis. One of the problems encountered in reducing or terminating steroid therapy in such patients is the difficulty of measuring reserve adrenal cortical function without discontinuing therapy.

Today, with the availability of such highly active steroids as fludrocortisone, it is possible to substitute this compound for cortisone or prednisone (i. e., 1 mg. of fludrocortisone for 25 mg. of cortisone or 5 mg. of prednisone) and carry out an adrenocorticotropin test, using the urinary steroid response (17-hydroxysteroids and 17-ketosteroids) as the measure of responsiveness. In this test, corticotropin should be given intravenously (25 units over an eight-hour period is suggested) for at least three days. The small quantity of metabolites of fludrocortisone will not affect the significance of the urinary values. However, when fludrocortisone is used, because of its intense sodium-retaining potency, dietary sodium chloride should be rigidly restricted, but 2 to 6 Gm. of potassium chloride daily may be given. The period of trial should be kept as short as possible, and a mercurial diuretic or chlorothiazide (Diuril) may be given if excessive fluid retention occurs.

Failure to observe an adequate response to intravenously administered corticotropin, although not necessarily indicating permanent adrenal atrophy, certainly suggests that hypoadrenalism will complicate withdrawal of steroid therapy. Unfortunately, an adequate response to corticotropin does not necessarily indicate that the patient's own hypothalamic-pituitary system will secrete an adequate quantity of corticotropin when steroid therapy is discontinued. At present, there is no practical way of deciding this point without careful withdrawal of steroid therapy and an analysis of baseline urinary steroid values.

This discussion naturally raises the problem of whether one should employ corticotropin therapy, intermittently throughout the course of prolonged steroid therapy, in order to prevent or minimize severe adrenal atrophy. It is true that the adrenal responsiveness may be maintained by such a technique, but unfortunately such a procedure will in no way minimize the hypothalamic or pituitary inhibition which may be the more serious problem. Recent studies have indicated that in disease states, such as asthma, adrenal cortical inhibition may be significantly modified by alternating a high dose of steroids for one to two days with a respite of one to two days, without loss of clinical regulation. This technique has not been applied systematically, nor has the adrenal response been studied accurately in other disease states. However, the program deserves further investigation.

Cushing's Syndrome

The clinical manifestations of Cushing's disease (pituitary basophilism) and those of Cushing's syndrome (adrenal cortical hyperfunction) are due to the production of an increased amount of adrenal steroids. The object of treatment is to decrease or eliminate the abnormal hormone secretion. This can be accomplished with certainty by complete removal of a tumor or of both adrenals if hyperplasia is present, theoretically by chemical inhibition of the pituitary-adrenal secretions or the blocking of the end-organ responsiveness to these hormones, and by ablation (surgery or radiation) of the pituitary when it is the primary site of the disorder.

Cushing's syndrome should be considered in every patient presenting hypertension, diabetes, osteoporosis, or skin manifestations characterized by ecchymoses and striae. Psychological manifestations are also a prominent aspect of the disorder. Definitive diagnosis rests upon detecting a tumor of the pituitary, adrenal, or ovary and the demonstration of an abnormal steroid excretion in the urine. The response to corticotropin and the character of the steroid excretion pattern may prove helpful in suggesting a histological diagnosis, i. e., carcinoma vs. adenoma vs. hyperplasia.

Cushing's syndrome is a serious but usually remediable disorder. It is unfortunate that many patients are permitted to progress to the point that therapy designed to correct the adrenal hormone secretion may not restore the individual to health because of complicating factors such as osteoporosis and fractures, permanent diabetes, hypertension, or severe psychological changes. For this reason, an early and a more radical approach to treatment is to be encouraged.

Tumor of the pituitary is demonstrated rarely. Radiation to the pituitary in such cases should be tried initially unless local pressure signs from the tumor (impairment of vision, headaches) indicate the need for immediate surgical intervention. If irradiation is carried out, there is no need for supplementary hormone therapy; if hypophysectomy is done, the patient should be carried through the operation with substitution therapy, as outlined in the section on acute adrenal crisis. The postoperative care will be that of a pituitary-deficient patient. In the case of removal of a tumor of the adrenal or ovary, the same hormone substitution program is utilized during or after surgery, as outlined in the section on acute adrenal crisis. However, during the immediate postoperative period after removal of a tumor of one adrenal, corticotropin should be tried, with urinary steroid measurements, to determine whether the remaining adrenal cortical tissue will function adequately.

In the presence of bilateral adrenal hyperplasia, the choice lies between an attempt to control the disease by pituitary irradiation, a subtotal adrenalectomy (usually removing one adrenal completely and two-thirds to three-fourths of the second adrenal), or complete bilateral adrenalectomy. The "cures" from irradiation of the pituitary alone are relatively infrequent and unpredictable but can be spectacular. Since several months must elapse before final evaluation of irradiation treatment can be made, it would seem wise to reserve irradiation for those patients in whom the disease is relatively mild and in whom one can be almost certain that tumor exists. As regards the choice of complete or subtotal adrenalectomy, the authors strongly favor the former, since recurrence of the disease is frequent when any adrenal cortical tissue remains and since in practice one must be prepared for adrenal insufficiency, at least in the presence of stress, in the majority of patients with a small remnant of tissue. Experience alone and the seriousness of the disease in the individual patient must weight the judgment of the physician and surgeon in determining the risk of recurrence if any tissue is left and the certainty of adrenal cortical insufficiency if all tissue is removed.

In recent years the development of hyperpigmentation, despite a level of cortisone adequate for all other needs, has been observed in certain adrenalectomized patients. This may occur in association with progressive enlargement of the sella turcica. Whether irradiation of the pituitary, carried out prior to or after adrenalectomy, will prevent or correct this evidence of excessive corticotropin or secretion of the melanocyte-stimulating hormone remains to be seen.

After adrenalectomy in patients with Cushing's syndrome, the dosage of cortisone or hydrocortisone must be followed carefully. Too rapid reduction may result in symptoms of acute adrenal insufficiency in a patient whose tissues have adjusted over the years to a relative excess of hormone. On the other hand, the prolonged administration of excessive doses of cortisone may accentuate the symptoms of Cushing's syndrome. With a good urine output, patients should be given generous quantities of potassium during the immediate postoperative period, i. e., at least 40 to 80 mEq. per 24 hours. In general, the dose of cortisone will be 300 mg. on the day of operation, 200 mg. on the first postoperative day, 150 mg. on the next, then 100 mg. for two to three days, 75 mg. for one week, and, finally, 50 to 62.5 mg. daily for an indefinite period. When the dose of cortisone is reduced below 75 mg. per day in the bilaterally adrenalectomized patient, additional salt or supplementary sodium-retaining hormone will be required, i. e., 1 to 5 mg. of desoxycorticosterone acetate given intramuscularly once daily or 0.1 to 0.2 mg. of fludrocortisone orally. Potassium supplementation, 3 to 6 Gm. daily, if tolerated, and testosterone propionate (25 mg. weekly for female patients) should be continued indefinitely if tolerated.

Adrenal Virilism and the Adrenogenital Syndrome

The clinical manifestations of excessive adrenal androgen secretion may be caused by a tumor or hyperplasia of the adrenal cortex. Steroid analysis of the urine, particularly the 17-ketosteroids, and fractionation of the 17-ketosteroids into those derived from hydrocortisone and those derived from adrenal androgens will be of specific diagnostic aid. Studies on the inhibition of adrenal androgen by cortisone or its derivatives, preferably prednisone or fludrocortisone, will be of additional help in differentiating tumor from hyperplasia and indicating whether medical therapy, i. e., long-continued cortisone therapy, is therapeutically feasible or whether surgery must be resorted to if the disorder is to be cured. The use of the most potent cortisone-like substances in the suppression test is to be encouraged, since the small quantity of ketosteroids derived from the exogenously administered hormone will not interfere significantly with the evaluation of the test. It is helpful to note that prednisone is not excreted as 17-ketosteroid material and hence can be advantageously used. This substance does, of course, give rise to increased 17-hydroxysteroid material in the urine.

Patients with virilism or the adrenogenital syndrome may display evidence of deficiency of sodium-retaining hormone. Under these circumstances, the clinical picture may be complicated by the presence of hypotension, weakness, small heart size, azotemia, hyponatremia, and hyperkalemia. The use of fludrocortisone (0.1 to 0.2 mg. daily by mouth) or a biweekly or monthly injection of the long-acting desoxycorticosterone trimethylacetate given intramuscularly (25 to 50 mg.) should provide satisfactory regulation. The dosage will, of course, be adjusted to maintain a normal blood pressure and electrolyte balance.

If a tumor is suspected in a patient with virilism or adrenogenital syndrome, surgery is advised; the care of the patient is similar to that outlined under Cushing's syndrome, with the exception that the cortisone dosage may be reduced much more rapidly postoperatively since hypercorticism was not present initially. A trial with corticotropin is essential, however, to test the adequacy of the remaining adrenal tissue before supplementary hormone is withdrawn completely. There is usually no need for potassium medication, testosterone, or sodium-retaining adrenal steroid therapy.

The problem is more difficult when virilization or adrenogenital syndrome is due to bilateral adrenal hyperplasia. If adequate suppression can be obtained with a dose of cortisone or cortisone-like steroid which will not induce the undesirable side-effects of Cushing's syndrome, medical management is feasible. Cortisone or hydrocortisone given intramuscularly is recommended for the initiation of treatment, i. e., 100 mg. daily for adults and older children; 25 mg. daily will suffice for infants. The minimum dosage required subsequently will be determined on the basis of the 24-hour urinary ketosteroid excretion. An effort should be made to maintain the level of 17-ketosteroids below 2 mg. in infants, below 7 mg. in older children, and below 10 mg. in adults. Infants will require 25 to 37.5 mg. of cortisone intramuscularly every three or four days; older children will require 50 to 100 mg. every three or four days. The dosage of hormone given orally will be two to three times that employed intramuscularly. The excreted products (17-ketosteroids) from the administered hormone will complicate the interpretation of the suppressive action of the therapy unless substances such as prednisone are used.

It is desirable to use supplementary potassium medication, i. e., 3 to 6 Gm. of potassium chloride daily, in an effort to minimize the hypochloremic, hypokalemic alkalosis which is so characteristically induced by long-term steroid therapy. The return of normal menstrual periods, the disappearance of acne, the regression of body hair, and the attainment of a normal female configuration comprise the criteria of success. Unfortunately, the inhibition of excessive hair growth may be very difficult to attain with steroid therapy.

In the event that suppression of androgen secretion cannot be obtained with a dose of cortisone-like steroid, which in turn does not induce Cushing's syndrome, one is faced with a difficult decision. Should one proceed with adrenal resection? In contrast to the approach to a patient with Cushing's syndrome, which is in itself life-threatening from a clinical viewpoint, mild virilism or the adrenogenital syndrome is not life-threatening, except in its serious psychological implications. If surgery is undertaken, the following steps are suggested:

1. Unless the adrenals are approached by an abdominal incision which permits the exploration of the ovaries, a pelvic exploratory operation or a culdoscopy with visualization of the ovaries must be undertaken before adrenal surgery. Such an initial step will permit the physician to evaluate ovarian function and the possibility of ovarian disease and to exclude the ovary as a source of androgen-secreting tissue.

2. In contrast to the approach to a patient with Cushing's syndrome in which radical bilateral complete adrenalectomy is to be encouraged, the patient with adrenal hyperplasia and the adrenogenital syndrome would do well to have one adrenal removed and only a portion of the second, in the hope that control of the syndrome might be accomplished by a more conservative procedure. No great difficulty should be encountered if a second, complete adrenalectomy is ultimately deemed necessary. The operative and postoperative needs for hormone therapy will be similar to those noted previously. Again, if a subtotal adrenalectomy is performed, a response to corticotropin should be undertaken prior to discontinuing supplementary hormone therapy. Of course, if sodium-retaining hormone had been required preoperatively, it will be necessary to continue this therapy. In addition, patients with unilateral adrenal removal and partial resection of the second gland may require supplementary sodium chloride or sodium-retaining hormone (fludrocortisone) by mouth once daily, desoxycorticosterone trimethylacetate given intramuscularly once monthly, or desoxycorticosterone acetate in oil, intramuscularly for daily use.

Finally, no patient with menstrual irregularities and a virilizing syndrome should have her adrenal explored (in the absence of a securely documented, unilateral adrenal mass) until ovarian exploration has been carried out. A deficiency of mineralocorticoids should also be excluded in all adrenogenital cases.

Primary Hyperaldosteronism (Conn's Syndrome)

All patients with hypertension, with unexplained episodes of weakness, with unexplained hypochloremic, hypokalemic alkalosis, and with unexplained polyuria and polydipsia should be screened for primary hyperaldosteronism. The majority of patients with primary hyperaldosteronism do not exhibit edema. The latter finding is characteristic of secondary hyperaldosteronism. A definitive diagnosis of primary hyperaldosteronism may be difficult to establish, because urinary aldosterone determinations are difficult to carry out, and norma values have been encountered in well-documente cases. It was hoped that a determination of th salivary sodium:potassium ratio, which can b easily measured, might provide a readily availabl screen for cases of primary hyperaldosteronism since aldosterone is known to affect the sodium concentration of saliva. At present it can be state that a value of more than 0.5 in salivary sodium potassium ratio is strong evidence against excessiv aldosterone secretion at that time. (The test i carried out in the morning, with care being take that no dentifrice or other sodium-containing med cation has been used; the analysis is made on th second 10-minute specimen with paraffin chewing the first 10-minute specimen having been di carded.) Values of less than 0.5 are frequent found in secondary hyperaldosteronism and probably in other conditions. Whether the salivar sodium:potassium ratio will assist in excluding th many patients who do not need definitive hormon studies remains to be seen. Of course, every patien with unexplained hypertension should have pyel grams, which may prove helpful in detecting large tumor. Unfortunately, small tumors bilateral adrenal hyperplasia are not likely to be detected by this means.

The diagnosis of primary hyperaldosteronism should be considered seriously in the presence of hypertension and hyperchloremic, hypokalemic alkalosis with a normal potassium content of the urine, i. e., 40 to 50 mEq. or more per 24 hours. Sodium restriction and potassium medication should ameliorate the symptoms, whereas unrestricted sodium and low-potassium intake should aggravate the disorder. Changes in the electrocardiogram, suggesting hypokalemia, may initiate the search for the disorder in patients with hypertension and cardiac abnormalities.

Since primary hyperaldosteronism is a life-threatening disorder, an active and aggressive attitude should be taken toward the diagnosis and treatment of the syndrome. The removal of a tumor presents no unusual therapeutic problems except that a generous potassium supplement should be provided preoperatively and postoperatively. An aldosterone-secreting tumor will *inhibit* the production of aldosterone by the opposite adrenal but will not inhibit the adrenal secretion of 17-hydroxysteroids and androgenic steroids. Postoperatively, one must watch for excessive sodium loss and be prepared for the administration of supplementary sodium salts or salt-retaining hormone as needed. In the absence of a tumor, a complete bilateral adrenalectomy may be necessary in a patient with hypertension and unexplained hypokalemia. Histological examination of the adrenals, certainly frozen sections, may not prove helpful in guiding the surgeon.

The operative and postoperative care of such patients, as far as adrenal hormone replacement is concerned, is identical with that previously described. However, since hypercorticism did not exist preoperatively, one may attain normal cortisone-replacement levels relatively rapidly after operation. Again, hypokalemia is probably the most serious immediate postoperative complication. One note of caution should be mentioned. Since patients with this condition may lose sodium rapidly and in large quantities postoperatively, if unsupervised, the patient may develop hyperkalemia as a consequence of excessive sodium loss and supplementary potassium medication at a time when his body tissues are markedly depleted of potassium. Daily serum sodium and potassium determinations are essential in the immediate postoperative management of these patients.

Secondary Hyperaldosteronism

The syndrome of edema, associated with increased urinary values for aldosterone, implies a causal relationship between secondary hyperaldosteronism and the edematous state. Four points deserve consideration. 1. An increase in urinary aldosterone excretion does not necessarily, but in all probability does, imply increased aldosterone production. 2. It has been shown that patients with heart failure and generalized edema may have normal aldosterone values until treatment is instituted. 3. A decrease in aldosterone excretion has been attained with adrenal inhibition, without a concomitant increase in sodium excretion, suggesting that, in such cases, secondary hyperaldosteronism was not at that particular time the determining factor in the production or maintenance of the edematous state. 4. A decrease in aldosterone excretion produced by inhibition of adrenal secretion or the administration of a competitive substance has resulted in a sodium diuresis in certain patients with edema and elevated urinary aldosterone values. In these patients it is presumed that secondary hyperaldosteronism has been an important factor in the genesis or maintenance of the edematous state. Finally, adrenalectomy in certain patients with edema has been followed by a sodium diuresis and marked clinical improvement in patients with hypertensive cardiovascular disease, the nephrotic syndrome, and cirrhosis with ascites.

From these considerations there is little doubt that secondary hyperaldosteronism is a frequent concomitant of the edematous state. There is considerable uncertainty as to its importance at any given stage in a patient's decompensation. Medical inhibition of aldosterone production or competition with the action of aldosterone on renal tubular mechanisms would appear to be the most promising approach to the clinical problem. Bilateral complete adrenalectomy for secondary hyperaldosteronism should be reserved for those patients in whom a direct relationship between sodium retention and hypersecretion of aldosterone can be demonstrated, and in whom the risk of major surgery may be justified by an important degree of or prolonged clinical benefit. The specific hormone requirements for the management of such patients will be similar to those employed in other cases of bilateral adrenalectomy, with the exception that cortisone-like steroids of less sodium-retaining capacity, i. e., prednisone and triamcinolone, will, in general, be preferred during the postoperative period.

Pheochromocytoma

Recent advances in the chemical determination of catechol amines in the blood and urine have provided definitive techniques for detecting the presence of pheochromocytoma in patients presenting paroxysmal or sustained hypertension, particularly when associated with anxiety, dizziness, palpitation, nausea, vomiting, sweating, precordial pain, and peripheral vasoconstriction.

After the demonstration of a tumor or elevated levels of urinary or blood catechol amines, surgical exploration should be undertaken. The use of intravenously administered phentolamine (Regitine) methanesulfonate prior to and during operation may be lifesaving in preventing an excessive rise of blood pressure. A solution of this substance should be available throughout the operation. Later with the ligation of adrenal vessels and the removal of a tumor, one must be prepared for a sudden and precipitous fall in blood pressure. This may be corrected by the use of levarterenol (Levophed) bitartrate given intravenously (never subcutaneously or intramuscularly). Phenylephrine (Neo-Synephrine) hydrochloride may be given subcutaneously to correct mild hypotensive episodes. Perhaps the most important postoperative maneuver is to keep the patient undisturbed for several hours on the operating-room table, as a sudden change in posture may precipitate collapse. Postoperatively, adrenal steroid therapy is not required unless a bilateral adrenalectomy has been performed. Postoperatively, the blood pressure can be controlled with phenylephrine. In the more severe cases it may require 48 to 72 hours before supportive medication can be withdrawn.

This study was supported, in part, by grants from the Eugene Higgins Trust, Harvard Medical School, and the John A. Hartford Foundation, New York.

COUNCIL ON FOODS AND NUTRITION

The following is one of the six papers presented at the symposium on "Nutrition in Pregnancy" in Columbia, Mo., Oct. 11, 1957. This symposium was sponsored by the Council on Foods and Nutrition, with the cooperation of the Boone County Medical Society, the University of Missouri School of Medicine, and the Adult Education and Extension Service of the University of Missouri.

Philip L. White, *Sc.D., Secretary.*
Council on Foods and Nutrition

VANDERBILT COOPERATIVE STUDY OF MATERNAL AND INFANT NUTRITION

XII. EFFECT OF REPRODUCTIVE CYCLE ON NUTRITIONAL STATUS AND REQUIREMENTS

William J. McGanity, M.D., F.R.C.S.(C), Edwin B. Bridgforth, A.B.
and
William J. Darby, M.D., Ph.D., Nashville, Tenn.

Numerous reports concerning the influence of maternal nutrition upon the course of pregnancy or the health of the infant have appeared during the past 20 years. These have led to the concept that the increased physiological nutritional requirements during pregnancy and lactation enhance the likelihood of nutritional deficiencies occurring during the reproductive interlude. Metabolic adjustments during this period may so alter the metabolism in some patients that a conditioned deficiency state may develop in spite of what would otherwise be considered an adequate dietary intake. The expectation of these alterations in nutrient requirement is reflected in estimates of nutrient allowances such as the Recommended Dietary Allowances of the Food and Nutrition Board.[1]

It has been hypothesized that a number of maternal and fetal complications peculiar to the reproductive interlude may be related to the nutritional level of the mother's diet.[2] From studies, such as Warkany's, on a variety of species of experimental animals, it is clear that the maternal nutritional level can influence fetal development, viability, birth weight, and other physiological attributes of the newborn animal. However, extrapolation from laboratory findings to situations commonly encountered in obstetric practice has resulted in inconsistencies and confusion of claims. Some of these have arisen as a result of the physician's failure to distinguish between conditions of obvious nutritional origin and conditions in which the etiology may possibly have a nutritional component.

Prior to any consideration of the effects of reproduction on maternal nutrition, it is desirable to recognize and to identify the present-day expectant mother in America. To base our premise on her pre-World War II status would be a gross injustice. Although obesity remains a national nutritional problem, the young mother of today is no longer willing to accept obesity as her price for having children, and she is doing something about it even prior to conception. Recent reports[3] have indicated that the average caloric consumption by nonpregnant, nonlactating women is 400 to 500 calories below the National Research Council's dietary allowance. This should be anticipated when one compares the modern woman's conservation of energy, resulting from our present-day centrally heated, motorized, and mechanized culture, with the energy expended by women in the past.

The metabolic and physiological changes during the reproductive interlude are manifest in every organ and system of the maternal body. We do not always take cognizance of the fact that the 40 weeks of gestation is the period of the most rapid growth and development known to medicine, that pregnancy is the most potent anabolic force we have, or that there is a placental barrier. It is also necessary to recall that alterations such as increased basal metabolism and blood volume, and decreased gastric acidity, gastrointestinal motility, and renal threshold do occur and may influence significantly one's interpretation of maternal nutriture.

It is the unquestioned aim of maternal nutriture to provide adequate amounts of the essential nutrients from conception through parturition and lactation. These nutrients provide for the mother's maintenance and the growth and development of the fetus and protect each from complications during or after the reproductive cycle.

Dietary, Biochemical, and Clinical Assessment

We have had the opportunity of making nutritional observations on a total obstetric clinic population over a period of years at Vanderbilt. The sample consisted of 2,338 pregnant white women who presented themselves for prenatal care at the

---

From the Department of Obstetrics and Gynecology and Preventive Medicine and the Division of Nutrition of the Department of Biochemistry, Vanderbilt University School of Medicine.

outpatient clinic. Economically, these patients fell into the lower income brackets ($1,200 to $3,000 per annum). From this study we obtained an objective quantitative description of changes that occur in nutritional physiology during the reproductive interlude. Our results were based on obstetric and pediatric performance and dietary, biochemical, and clinical assessment obtained prior to the recognition or development of any abnormality. The several observations were repeated during each trimester and at the postpartum examination. From the data amassed, the effect of pregnancy and lactation on maternal nutritional status was determined, and a yardstick was provided for nutritional requirements in pregnancy. A great effort was made to prevent revealing the results of the nutritional estimates to the physician or patient. This avoided influencing management of the diet.

Table 1.—*Average Daily Nutrient Intakes for Each Trimester*

	Trimester		
	1st	2nd	3rd
Diet records, No.	278	1,222	1,665
	Means		
Total calories	2,110	2,200	2,020
Protein, Gm.	75	75	70
Calcium, Gm.	1.1	1.1	1.0
Iron, mg.	13	11	13
Thiamine, mg.	1.5	1.5	1.4
Niacin, mg.	12	12	11
Riboflavin, mg.	2.5	2.5	2.3
	Medians		
Total vitamin A activity, I.U.	6,500	6,600	5,900
Vitamin C, mg.	66	62	55

Nutrient Intakes.—The average daily nutrient intakes of this group of patients are indicated in table 1. We did not (and do not) routinely prescribe pharmaceutical supplements in our clinic. Seventy-three per cent of our patients received no dietary supplement. In the remaining 27%, the type and period of supplementation varied, but it was seldom extended throughout the whole period of gestation. In calculating nutrient intakes, the contribution made by pharmaceutical supplements is not included. Although these average nutrient intake levels are not all equal to those of the recommended allowances from the Food and Nutrition Board, they are not disturbingly low. There is a somewhat surprising decrease of approximately 200 calories in intake between the second and the third trimester. *This is associated with a similar decrease in the consumption of most of the other individual nutrients.* As will be seen subsequently, considerable variation occurred around these average figures. The food patterns of these women were gratifyingly varied and revealed no widespread disturbing food prejudices or fads associated with pregnancy. Their diets showed frequent consumption of the necessary basic nutrients supplied by milk and eggs, green and yellow vegetables, and citrus and other fruits. Individuals revealed a remarkable degree of constancy of nutrient intake between successive trimesters and even successive pregnancies.

Why did the decrease in caloric consumption between the second and the third trimester occur? Is it a reflection of maternal design or of the physician's advice? We know that the physician's advice was responsible, in a large part, for the decline in caloric intake of patients who were obese, who gained weight rapidly, or who were preeclamptic. However, the decreased intake was not limited to these categories. It appears that the recommended standards of caloric intake during pregnancy are too high for today's expectant mother. It is reasonable to postulate that *the reduced intake during the latter months of pregnancy* reflects lessened activity on the part of the mother.

Changes in Body Fluids.—The biochemical measurement of body fluids revealed nutrient levels consistent with values that one expects in healthy populations. In both the blood and the urine several alterations in nutrient levels were found. These reflected gestational lactational influences and revealed *significant differences in nutrient concentrations* when compared with nonpregnant values. These alterations fell into the following categories: 1. The mean hematological values (but not the indexes), total serum protein, and serum vitamin A, and the urinary excretion of thiamine and riboflavin showed a decline in concentration during the first 32 to 34 weeks of gestation and a postpartum rise, mirroring the changes in circulating blood volume. *Figure 1 illustrates this pattern for serum protein* determinations. The dietary intake of these nutrients does not account for this observed biochemical change. 2. For the mean levels of serum carotene and tocopherol and the urinary excretion of N′-methylnicotinamide, a progressive increase in concentration during pregnancy and a postpartum decline were found. Figure 2 shows this for serum vitamin A and carotene levels. For the two fat-soluble vitamins, the pattern suggests that the lipid-transporting ability of the serum is increased during

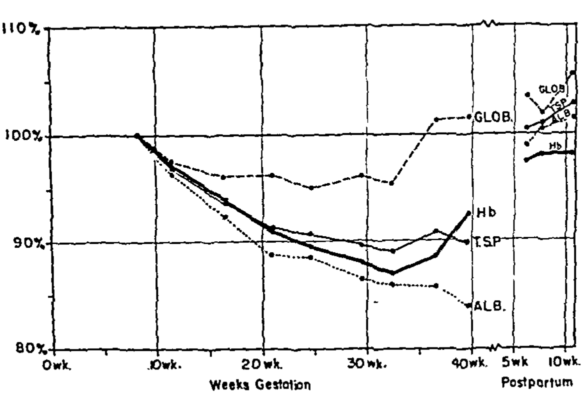


Fig. 1.—Serum protein determinations by weeks of gestation as percentage of 5-to-8-week values.

pregnancy, paralleling the known increase in serum cholesterol value. Again, this alteration was not related to the intake levels of any of the nutrients. 3. The mean serum ascorbic acid concentration decreased slightly during gestation (fig. 3). However, when the dietary intake of vitamin C was above 80 mg. per day, this decline during the prenatal phase did not take place. A further sharp decline occurred post partum in the group of women (71%) who breast-fed their infants. Mothers who fed their infants artifically did not exhibit this postpartum drop-off. This evidence of lactational change appeared at all levels of intake of vitamin C.[4] 4. There was a progressive increase in the absorption and utilization of iron as pregnancy advanced (fig. 4). During the last 10 weeks of pregnancy, the uptake of iron was three times that of the first trimester level.[5]

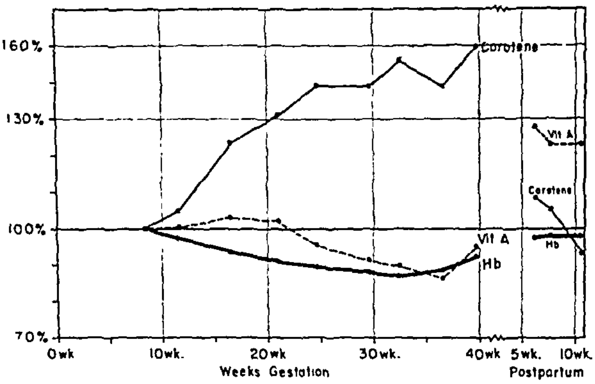


Fig. 2.—Serum vitamin A and carotene determinations by weeks of gestation as percentage of 5-to-8-week values.

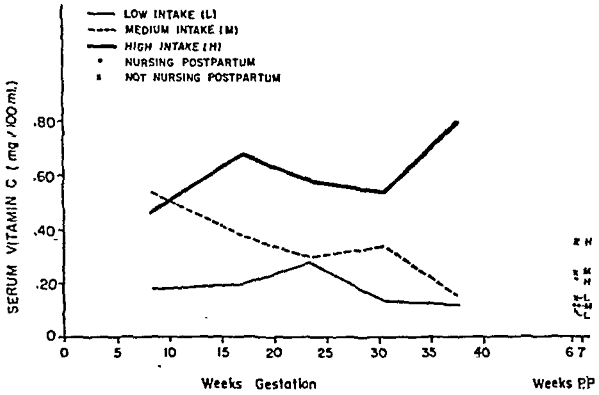


Fig. 3.—Median serum vitamin C levels in consistent intake groups, February to June.

All these alterations reflect metabolic changes of apparently normal physiological origin. To assay biochemical measurements during the reproductive interlude against normal nonpregnant, nonlactating values reveals a lack of understanding of the fundamental adjustments occurring in the pregnant and lactating mother.

Obstetric Complications.—The obstetric and pediatric details of our study have been reported.[6] Suffice it to say that the age and parity relationship of the group reflected a normal pattern. Table 2 demonstrates that this population may be considered as an average, or slightly better than average, obstetric population encountered in the United States. This supports the validity of the generalization of our results.

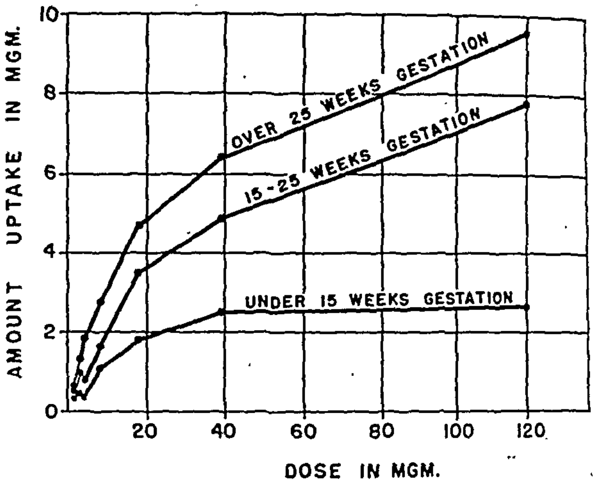


Fig. 4.—Relationship between median amount uptake of iron and dose level during three periods of pregnancy.

The mean height of the women included in the study was 64 inches. The median weight increased from 122 lb. (55.3 kg.) in the first trimester to 139 lb. (63.0 kg.) in the third trimester and then dropped back to 126 lb. (57.1 kg.) at the time of the examination six weeks post partum. Obesity was recorded for 15.7% of the women and varied from 11.5% during the first trimester to 19.3% during the third trimester of pregnancy. Undernutrition was least frequently seen during the last trimester.

Table 2.—*Percentage Incidence of Some Obstetric Complications*

	National Estimates, %*	Vanderbilt Study, %
Anemia	10	11.3
Preeclampsia	6-7	4.5
Eclampsia	0.7	0.5
Placenta previa	0.5-1.0	0.4
Premature separation of placenta	0.3-1.0	1.2
Abortions, spontaneous	10	4.4
Prematurity	6-12	6.7
Twins	1.2	1.1
Breech presentation	3.0	3.9
Cesarean section	2.0	3.2
Postpartum hemorrhage	1-6	1.0
Puerperal morbidity	...	5.4
Congenital malformations	2.3-3.0	2.6
Stillbirths/100 total births†	1.84	1.5
Neonatal deaths/100 total births†	2.12	2.0

* Widely accepted national or textbook figures.
† Average rate in United States for whites, 1946 to 1950.

As would be expected, the occurrence of dependent edema and varicosities was greater in the latter half of gestation, reaching a peak in the third trimester and returning to more usual levels post partum. No instances of clinically recognizable deficiency disease were encountered during the reproductive interlude.

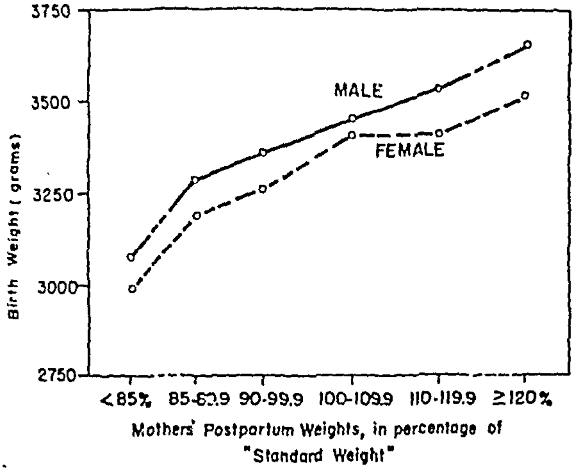


Fig. 5.—Relationship between average birth weight of liveborn singletons and mothers' postpartum weights.

Although the average findings revealed a satisfactory status for the group as determined by dietary, biochemical, and clinical assessment and by obstetric and pediatric performance, some women were underweight or overweight, some ate poorly, some ate excessively, some had low blood and urinary levels of nutrients, and some had obstetric and pediatric difficulties. Further examination of these factors may point out weaknesses in maternal nutriture and provide a basis for establishing nutrient requirements during the reproductive interlude.

Weight Status.—The mean height and weight data by trimester revealed an average woman with an acceptable weight gain for her pregnancy. The underweight group (less than 85% standard weight) recorded the highest dietary intakes and was concentrated in the lower parity groups, for as parity went up, the incidence of underweight declined. In this group, there was an increased frequency of mothers who artificially fed their infants and an increased incidence of prematurity. However, the latter should be anticipated because of the linear relationship between the mother's usual percentage of standard weight and the birth weight of the infant (fig. 5). On the other hand, the underweight group had fewer neonatal deaths and congenitally malformed infants.

The overweight group (greater than or equal to 120% of standard weight) increased as age and parity advanced. Among primigravidas who were under 30 years of age, obesity was observed in 15% of the group, whereas among women over 30 years of age and/or para IV or more 36% were overweight. The overweight group had the lowest recorded dietary intakes. There were significantly higher mean hematological and serum protein and vitamin A values, a threefold increase in preeclampsia, more stillborn children, and a lowered frequency of puerperal morbidity.

Regardless of weight status, there were high weight gainers in all groups—underweight, normal, and overweight—and with all ages of women. These high gainers ate more, particularly during the second trimester, and had more toxemia. It is clear from our data that the physician clamped down on the nutrient intake of both the overweight and high weight gainers. In the obese women with high weight gains, the caloric intake was reduced an average of 900 calories from the first to the third trimester.

Low Hemoglobin Group.—Consideration of maternal and fetal iron needs, iron absorption and utilization, and normal gestational alterations in hematological values is necessary prior to discussing the problem of anemia. In a normal pregnancy, the expectant mother will require the absorption and utilization of 700 to 1,000 mg. of elemental iron for her own needs and those of the fetus. If bleeding is absent during gestation, she is able to conserve about 240 mg. of elemental iron as a result of the cessation of the menstrual loss. In addition, her ability to absorb and utilize iron is enhanced at least threefold during the third trimester when her own and the fetal demands are greatest. Coincident with the changes in circulating blood volume (plasma and red blood cell volume) and increased hemoglobin mass, there is a progressive fall in the mean hematological values until the 32nd to 34th week of gestation and then a significant rise prior to delivery that continues upward during the puerperium. In the case of the hemoglobin, this rise amounts to 0.8 Gm. per 100 ml. during the last six to eight weeks of gestation (fig. 6) and is independent of either nutrient iron intake or iron supplementation. An alternative manner of presenting this rise is shown in figure 7. Here the hematological

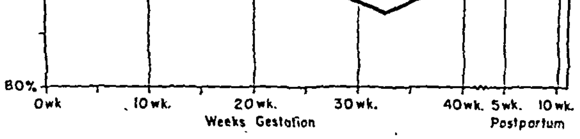


Fig. 6.—Hematological determinations by weeks of gestation as percentage of 5-to-8-week values.

values at delivery are considered the 100% line (not all women delivered at 40 weeks of gestation). It is apparent that the average hemoglobin value at 18-to-20-week gestation is the same as it will be at the time of delivery. These alterations in hematological values were associated with minimal depression of the blood indexes (fig. 8). The decrease in mean cell hemoglobin concentration (MCHC) in the third trimester seems to reflect the increased need for iron by the mother during the latter portion of her pregnancy, a need which was apparent in the pattern of absorption and utilization of this element. The more pronounced decrease apparent in the puerperium is, in all likelihood, the result of blood loss occurring during or after delivery.

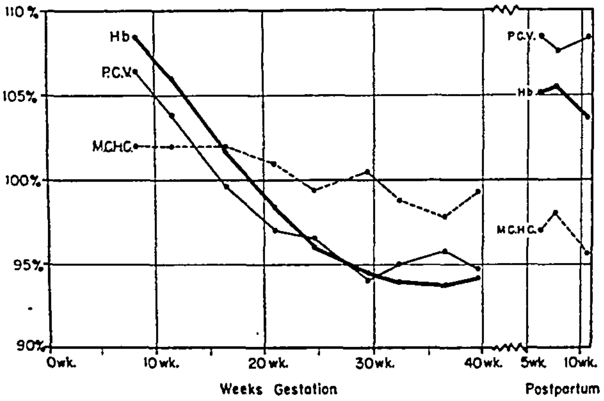


Fig. 7.—Hematological determinations by weeks of gestation as percentage of delivery values.

The "low hemoglobin group" consisted of women who had a hemoglobin level of less than 10 Gm. per 100 ml. On this basis, 232 (11.3%) were so classified—10.5% during the prenatal phase and 0.8% in the puerperium. Of the 196 women who had hemoglobin values below 10 Gm. per 100 ml. in the third trimester, not more than 27% had blood indexes indicative of iron deficiency anemia (table 3). In the total study group of 1,974 there were only 4% who had either a mean cell volume (MCV) or a mean cell hemoglobin concentration (MCHC) indicative of iron insufficiency. Two hundred sixteen of the women developed their low hemoglobin values during the prenatal period (148 in the third trimester), 209 of them having hemoglobin levels above 10 Gm. per 100 ml. at the time of their postpartum examination. The remaining 7 women, plus an additional 16, revealed low hemoglobin values (less than 10 Gm. per 100 ml.) at the time of postpartum examination. From the observations indicating excessive blood loss during the latter half of pregnancy, delivery, or puerperium, it is evident that this group had a conditioned iron deficiency.

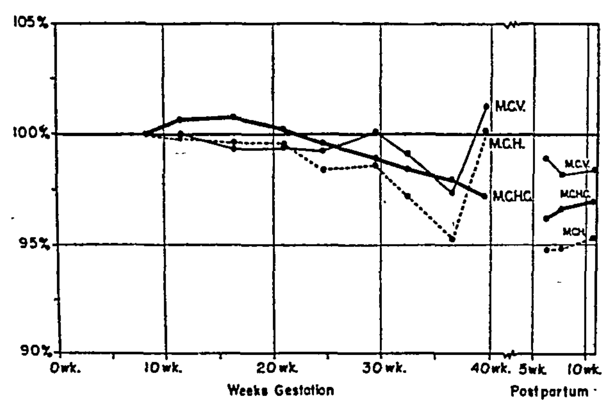


Fig. 8.—Blood indexes by weeks of gestation as percentage of 5-to-8-week values.

The iron and vitamin C intakes of the low hemoglobin group tended to be lower throughout the whole of pregnancy when compared with the intakes of these nutrients by the other groups. However, it is difficult to accept mean intakes of 12 mg. of iron and 46 mg. of vitamin C as deficient values. In the group with hemoglobin levels below 10 Gm. per 100 ml., there was a general lowering of the other blood and serum determinations and an increased incidence of dependent edema in keeping with an increased circulating plasma volume.

Table 3.—*Distribution of Hemoglobin Values*

	Third Trimester Hemoglobin, Gm./100 Ml.				
	<10.0	*10.0-10.9*	*11.0-11.9*	≥12.0	Total
Patients, no.	196	351	569	858	1,974
Patients, %	10	18	29	43	100
Patients with packed cell volume, <30%, %	32	1	0	0	3
Patients with mean cell volume <75 cu. μ, %	19	5	2	1	4
Patients with mean cell hemoglobin concentration <30%, %	27	6	2	0	4
Patients with mean cell volume <75 cu. μ and mean cell hemoglobin concentration <30%, %	9	0	0	0	1

Only 35% of the low hemoglobin group received prescriptions for supplemental iron, and there were no differences in the recorded dietary intakes of iron between women who were supplemented and those who were not. During the third trimester the MCV and MCHC of the group receiving supplements remained significantly lower than in the group not receiving supplements. It was not until the postpartum examination that these hematological differences between the supplemented and the unsupplemented group disappeared. This was particularly noteworthy for patients who had excessive loss of blood during the prenatal period, at delivery, or during the puerperium due to factors such as placenta previa, premature separation of the placenta, postpartum hemorrhage, and, possibly, abortion. At the time of postpartum examination, those patients with excessive blood loss had hemoglobin levels as much as 1.8 Gm. below the values for the total study group. In spite of what was considered unit-for-unit blood replacement and some supplementation with iron during hospitalization, there was failure to replace the patient's blood loss by approximately 500 ml. This is conditioned iron deficiency. The need for iron supplementation in such instances is evident.

Strauss[7] has demonstrated that the children of mothers who have severe iron deficiency anemia at term are themselves anemic at one year of age. Our data[8] on the mothers with low hemoglobin levels at delivery (fig. 9) reveal no differences in the infants' hemoglobin levels during the first year of life when compared with those of infants delivered of mothers in the high hemoglobin group. Although the mothers in our study did not exhibit a major degree of iron deficiency, it is evident that, even if the infant's iron stores at delivery were inadequate, proper infant feeding during the first year of life was corrective and preventative.

Lactation.—The period of maternal lactation has been less well studied than the gestational phase. The obstetrician, pediatrician, and general practitioner alike have tended to overlook, in terms of maternal nutrient needs, the demands of lactation and associated maternal factors.

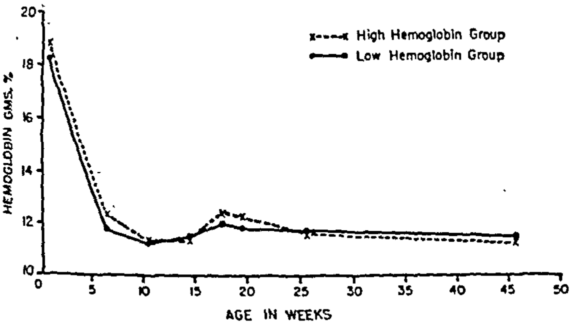


Fig. 9:—Infant hemoglobin determinations.

Certainly the mother's activities are increased. In addition, she must provide large amounts of protein, carbohydrates, minerals, and vitamins, as well as calories, for her suckling infant. These demands must be met by the mother's food sources or body stores. If her dietary intake is not adequate, it is to be expected that some weight loss will occur. Here is a period that requires a great deal more attention by nutritionally minded physicians—general practitioner, obstetrician, and pediatrician.

At the time of discharge from the hospital, 71% of the mothers in our studies were breast-feeding their infants as compared with the national estimate of 65 to 80% of the mothers. Insufficient milk was the commonest cause given for complete or partial supplementation. Nursing increased with parity and decreased among primiparas over 25 years of age and among mothers less than 85% of standard weight. There was more nursing among women with higher levels of intake of calcium, phosphorus, and riboflavin and more artificial feeding among mothers who had received calcium supplementation. These groups reflected differences in milk consumption between those who nursed and those who did not nurse their infants, since mothers who stated they drank fewer than three glasses of milk per day had a higher frequency of calcium supplementation.

Clear biochemical evidence of lactational demand was shown by the lowered postpartum serum vitamin C levels among the mothers who nursed their offspring (fig. 3). This was not dependent on the nutrient intake of ascorbic acid, since it occurred with all intake levels. When the nutrient intake was above 80 mg. per day, the postpartum serum levels could be maintained at approximately 0.3 mg. per 100 ml. This is in contrast to the serum vitamin C levels of 0.6 to 0.8 Gm. during gestation, with the same level of dietary intake.

Detailed analyses of the relationship of various obstetric and pediatric complications to varying levels of nutrient intake and biochemical measurements on maternal nutriture have been recorded previously.[9] In summary, we can say that for our patients nutritional deficiency does not emerge as a primary causative factor in any of the metabolic diseases of pregnancy that are of unclear etiology. The obstetrician who assures his patient freedom from such complications as toxemia and prematurity by advocating an abundant nutrient intake must expect disappointment. However, we do not wish to be interpreted as concluding that nutrition is unimportant in pregnancy. The necessity of insuring an adequate dietary during pregnancy is unquestioned.

Nutrient Requirements in Reproduction

The target level of nutrient intake during the reproductive interlude may not be defined within a narrow range, since it is dependent upon factors such as activity demands, initial weight status, and stage of gestation. It would be unrealistic to allow three women, each 5 ft. 4 in. tall but weighing 100, 122, and 180 lb. (45.4, 55.3, and 81.6 kg.), respectively, to gain the same amount of weight during pregnancy and to recommend the same nutrient intake. In the following discussion, we shall direct our attention to the mean patient from our study—the woman who is neither underweight nor overweight for her height and body build.

Is there evidence that improved nutrition could be expected to prevent the occurrence of gestational complications? In an effort to answer this question, we have examined the groups at the extremes of dietary intake (table 4). The limits of high and low extremes of nutrient intakes were chosen as greater than one or two standard deviations above or below the mean or median values. Two general deductions are pertinent. 1. A more abundant nutrient intake as estimated by caloric level was not associated with a decrease or increase in fetal or obstetric complications, with differences in birth weight or length of the infant, or with physical or biochemical changes (table 5). Similar findings were obtained when the intake estimates were grouped on a basis of protein. 2. When the mother's intake was less than 1,500 calories or less than 50 Gm. of protein, positive correlations were found between certain obstetric and fetal complications and dietary intake during the third trimester. However, the observed increase in incidence of these obstetric and fetal conditions appeared to be responsible for the lowered intakes and not vice versa.[9d]

TABLE 4.—*Approximated Nutrient Intakes, Means or Medians, and Ranges, of Any Trimester*[*]

Nutrient†	—2 S.D.	—1 S.D.	Mean	+1 S.D.	+2 S.D.
Total calories	1,000	1,500	2,100	2,750	3,250
Protein, Gm.	40	50	72	90	110
Calcium, Gm.	0.25	0.75	1.10	1.50	2.00
Iron, mg.	6	10	13.5	18	22
Thiamine, mg.	0.7	1.0	1.4	1.9	2.2
Riboflavin, mg.	0.5	1.5	2.5	3.5	4.5
Niacin, mg.	4.0	8.0	12.0	16.0	20.0
	2½%	16%	Median	84%	97½%
Vitamin A, I.U.	1,000	3,000	6,000	11,000	19,000
Vitamin C, mg.	20	40	60	100	160

* Ranges are 1 or 2 standard deviations above or below mean or median equivalents.

† Values are rounded to fit interval groupings of coded material.

Keeping in mind the modern woman's desire to remain trim, her living pattern, the apparent reduced activity of the expectant mother during the third trimester, the physician's desire to limit weight gain, and the nutritional demands of both mother and infant, this study does not provide evidence to indicate that dietary intakes greater than the average reported or greater than the allowances of the National Research Council will bestow protective benefits during pregnancy. A dietary that will provide the recommended levels of nutrients is readily attainable from food sources in all sections of the country without the need of supplementation. During lactation, on the other hand, less extensive evidence clearly indicates an enhanced caloric expenditure or loss of nutrients for the nursing mother.

TABLE 5.—*Comparison of Third Trimester Caloric Intakes With Third Trimester Laboratory Levels*[*]

	Daily Caloric Intake					
	<1,500	1,500-1,999	2,000-2,499	2,500-2,999	>3,000	Total
Cases with diet records, no.†	330	555	443	221	116	1,665
	Means					
Hemoglobin, Gm./100 ml.	11.71	11.77	11.62	11.67	11.70	11.70
Red blood cells, million/cu. mm.	3.95	3.98	3.95	3.94	3.98	3.96
Packed cell volume, %	35.5	35.6	35.5	35.2	35.9	35.5
Mean cell volume, cu. µ	90.4	90.1	90.3	89.7	90.7	90.2
Mean cell hemoglobin, micromicrogram	30.2	30.1	30.1	30.1	30.2	30.1
Mean cell hemoglobin concentration, %	33.6	33.5	33.4	33.6	33.5	33.5
Total serum protein, Gm./100 ml.	6.31	6.34	6.30	6.36	6.36	6.33
Serum albumin, Gm./100 ml.	3.98	4.05	4.04	4.04	4.09	4.03
Serum vitamin A, I.U./100 ml.	101.0	102.0	100.0	98.0	102.0	100.8
Serum carotene, mcg./100 ml.	159.0	159.0	169.0	156.0	162.0	161.2
	Medians					
Serum vitamin C, mg./100 ml.	0.351	0.344	0.368	0.371	0.360	0.356
Thiamine excretion, mg./2 hr.	0.087	0.089	0.094	0.098	0.091	0.091
Riboflavin excretion, mg./2 hr.	0.703	0.733	0.781	0.699	0.760	0.740
N′-methylnicotinamide excretion, mg./2 hr.	10.0	9.5	9.9	9.4	10.4	9.74

* Laboratory levels for given caloric groupings.

† Laboratory values missing in approximately 2% of cases.

We realize that prophylactic broad-spectrum supplementation is commonly prescribed for both private and clinical obstetric patients throughout the country. We use the word "supplement" meaning "to add to, to bring up to adequate levels," rather than "therapeutic." An examination of the label of reputable prenatal preparations shows that the manufacturer's suggested daily dosage will provide from two to five times the National Research Council's recommended allowance for the individual minerals and vitamins. The general routine use of such dosages is extravagant, needless medication. When the obstetrician is concerned that his patient is not obtaining from food sources amounts of minerals and/or vitamins equal to the National Research Council's recommended allowances, simple dietary instruction will usually be corrective. Failing this, supplementation should be aimed at a level that will bring the individual up to the recommended allowances.

Except among women with iron deficiency anemia, we have been unable to find any significant difference in the incidence of maternal or fetal abnormalities or in the clinical nutritional assessment of the groups who received supplements (iron, calcium, or vitamin B complex) and the groups who did not receive supplements. In this instance, as would be true with any nutritional deficiency disease of demonstrable etiology, supplementation is of undisputed value. A less clear situation is present with ascorbic acid nutriture. Although it is apparent that one can maintain serum vitamin C levels during the prenatal period with intakes above 80 mg. per day, some postpartum decline occurring as a result of lactation cannot be prevented. If it is protective to keep serum levels up and if food sources do not provide 80 to 100 mg. of vitamin C, it may be desirable to provide supplements.

Summary

Observations on a total obstetric clinical population have been made. We believe that the findings of this study are widely applicable. Alterations in the patterns of dietary intake and biochemical values during the reproductive interlude revealed fundamental physiological changes in the pregnant and lactating mother. There was a decrease of approximately 200 calories in the average intake between the second and the third trimester. This was associated with a similar decrease in the consumption of most of the individual nutrients.

The change in blood constituents fell into four patterns: (1) a decline during the first 32 to 34 weeks of gestation followed by a postpartum rise; this was present for the mean hematological values, total serum protein, and serum vitamin A, and the urinary excretion of thiamine and riboflavin; (2) a progressive increase during pregnancy followed by a postpartum decline; this pattern was exhibited by serum carotene, tocopherol, and the urinary excretion of N′-methylnicotinamide; (3) a slight decrease in the mean serum vitamin C levels during gestation followed by a further sharp decline post partum among lactating mothers; and (4) a progressive increase in the absorption and utilization of iron as pregnancy advances.

The effects of underweight and overweight, maternal low hemoglobin levels, and lactation on maternal nutriture are described in relation to obstetric and pediatric performance. From conception through parturition and lactation, maternal nutrition should provide adequate amounts of those nutrients that are essential for the mother's maintenance and the growth and development of the fetus. From the present study, it is clear that dietary intakes, greater than the Recommended Dietary Allowances of the Food and Nutrition Board, will not bestow protective benefits during pregnancy. It appears that the recommended standards for calories are too high for the expectant mother of today. A dietary that will provide the essential nutrients is readily attainable from food sources. The common obstetric routine of broad-spectrum nutritional supplementation is questioned, both as to need and as to dosage level. It is apparent that, for the effective use of supplements, the physician must understand the normal physiological changes associated with the reproductive interlude.

This study was supported by grants from the Nutrition Foundation, Inc., the International Health Division of the Rockefeller Foundation, the U. S. Public Health Service, the Tennessee Department of Public Health, and Distillation Products, Inc.

Tables 1 and 2 and figure 5 are reproduced with permission from *Obstetrics and Gynecology.*[9f] Table 4 is reproduced with permission from *American Journal of Obstetrics and Gynecology.*[9d] Table 5 is reproduced with permission from *Journal of the American Dietetic Association.*[9e] Figure 4 is reproduced with permission from *American Journal of Obstetrics and Gynecology.*[5] Figure 9 is reproduced with permission from *Pediatrics.*[8]

References

1. Food and Nutrition Board: Recommended Dietary Allowances, Publication 302, National Academy of Sciences, National Research Council Report, 1953.

2. Ebbs, J. F.; Tisdall, F. F.; and Scott, W. A.: Influence of Prenatal Diet on Mother and Child, J. Nutrition **22:**515-526 (Nov.) 1941. Burke, B. S.; Beal, V. A.; Kirkwood, S. B.; and Stuart, H. C.: Nutrition Studies During Pregnancy, Am. J. Obst. & Gynec. **46:**38-52 (July) 1943. Tompkins, W. T.; Mitchell, R. M.; and Wiehl, D. G.: Maternal and Newborn Nutrition Studies at the Philadelphia Lying-In Hospital, Annual Conference of the Milbank Memorial Fund, New York, 1955.

3. Youmans, J. B.; Patton, E. W.; and Kern, R.: Surveys of Nutrition of Populations: Description of Population, General Methods, and Procedures, and Findings in Respect to Energy Principle (Calories) in Rural Population in Middle Tennessee, Am. J. Pub. Health **33:**58 (Jan.) 1943. Swanson, P., and others: Food Habits of Women 30-90 Years Old, Fed. Proc. **11:**457 (March) 1952. Clark, F., and Finder, L. J.: Nutrition Control of Homemakers' Meals, U. S. D. A. Agric. Inform. Bull. **112:**3, 1954.

4. Martin, M. P.; Bridgforth, E. B.; McGanity, W. J.; and Darby, W. J.: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: X. Ascorbic Acid, J. Nutrition **62:**201-224 (June) 1957.

5. Hahn, P. F., and others: Iron Metabolism in Human Pregnancy as Studied with the Radioactive Isotope Fe^{59}, Am. J. Obst. & Gynec. **61:**477-486 (March) 1951.

6. McGanity, W. J., and others: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: V. Description and Outcome of Obstetric Sample, Am. J. Obst. & Gynec. **67:**491-500 (March) 1954.

7. Strauss, M. B.: Anemia of Infancy from Maternal Iron Deficiency in Pregnancy, J. Clin. Invest. **12:**345-353 (March) 1933.

8. Woodruff, C. W., and Bridgforth, E. B.: Relationship Between Hemogram of Infant and That of Mother During Pregnancy, Pediatrics **12:**681-685 (Dec.) 1953.

9. (*a*) Darby, W. J., and others: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: I. Background, II. Methods, III. Description of Sample and Data, J. Nutrition **51:**539-565 (Dec.) 1953. (*b*) Darby, W. J., and others: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: IV. Dietary, Laboratory, and Physical Findings in 2,129 Delivered Pregnancies, ibid. **51:**565-597 (Dec.) 1953. (*c*) Ferguson, M. E., and others: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: VII. Tocopherol in Relation to Pregnancy, ibid. **55:**305-321 (Feb.) 1955. (*d*) McGanity, W. J., and others: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: VI. Relationship of Obstetric Performance to Nutrition, Am. J. Obst. & Gynec. **67:**501-527 (March) 1954. (*e*) McGanity, W. J., and others: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: VIII. Some Nutritional Implications, J. Am. Dietet. A. **31:**582-588 (June) 1955. (*f*) Darby, W. J.; Bridgforth, E. B.; Martin, M. P.; and McGanity, W. J.: Vanderbilt Cooperative Study of Maternal and Infant Nutrition: IX. Some Obstetric Implications, Obst. & Gynec. **5:**528-537 (April) 1955. (*g*) Reference 4.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

•

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

PREVENTIVE MEDICINE

AT ONE TIME, preventive medicine was synonymous with public health. Nowadays it is an integral part of total medical care. Not so long ago, preventive medicine was thought to be limited to sanitation and other forms of environmental and regulatory control. Today the term prevention in medicine applies not only to immunizations but to the avoidance of sequelae and recurrence as well as the prevention of communicability.

Communicability is not limited to contagion. The personal physician must prevent the spread of symptom-complexes to other members of the family. He must prevent seemingly unrelated ill-effects on persons associated with the patient. These ill-effects may arise merely because of the cultural and environmental changes associated with having a sick person around, although they have no direct connection to the specific illness. Lastly, the physician must be interested in adverse effects—economic, social, and especially emotional—that can arise as side-effects of being sick.

How much time can a physician spend doing preventive medicine, when his patients demand so many of his curative skills? The answer to such a question might be as much as the immediate care of the sick will allow. But, if the factor of health promotion is considered rightfully as part of the prevention of disease, the average practitioner spends a great deal more time and effort than the public, or even he himself, supposes.

There are many concepts to consider in the practice of preventive medicine. Primarily, there is the aspect of patient acceptance. Secondarily there is the matter of what diseases or illnesses can be prevented. In the first instance, how many people, in apparent good health, seek out their family physician strictly for the purpose of maintaining their "well" state of being? A survey conducted seven years ago implied that only 5 out of every 100 patients seeking medical care or advice were primarily interested in preventing future disease. The remainder had acute (to the patient) medical problems requiring immediate and specific care. After such care the patient usually declines to continue having medical attention.

As to the matter of which diseases offer applicable preventive techniques, it might be said that wherever the etiology is known, or even suspected, there eventually will be a means of avoidance. Other than communicable (micro-organism) diseases, such generalizations include nutritional illnesses, allergic manifestations, occupational conditions, accidents, and certain psychiatric syndromes, to name but a few.

Many physicians have tried to entice well patients to have their eyes examined for glaucoma, to have their urine tested for diabetes, or in the past, before x-rays became secondary to tuberculin testing as a case-finding procedure, to have a "free" chest examination. Who takes advantage of such preventive techniques? Too often, not the man who is coughing. Nor the person whose mother had diabetes. Nor the woman who is having difficulty seeing. These people, like so many others, seem to be more afraid of learning something is wrong than they are of preventing serious consequences. They have been taught, through publicized advances of medical science, that there would be a cure should the disease ever really take hold. Fear of finding out is greater than the publicized fear of actually having a malady.

A physician cannot force any form of medical care on the public. While some legislative acts require utilizing various preventive practices, such acts do not project their over-all value in terms the average person can understand. The recent laxity in poliomyelitis immunizations seems to confirm this point of view. Perhaps a future job will be to promote the idea of total medical care on a personal basis, to include seeking preventive medical care from the physician's office. Every disease or illness that is prevented allows that much more time to devote to the sick.

THE GENERAL PRACTITIONER'S AWARD

The House of Delegates of the American Medical Association at the 12th Annual Clinical Meeting in Minneapolis on December 2 named Dr. Lonnie A. Coffin of Farmington, Iowa, the general practitioner of the year. He was presented with a gold medal and citation by Dr. Gunnar Gundersen, President of the American Medical Association. Dr. Coffin, who is the first Iowan to receive this honor, was born on a farm in Clark County, Missouri, in 1890 and moved to Iowa at the age of 5. He was a member of the last medical class to be graduated from Drake University in Des Moines. After a year of internship at Iowa Methodist Hospital in Des Moines he established a general practice in Farmington. Except for two years of military service in World War I he has served his community continuously for 44 years. Mrs. Coffin died last year, but he is fortunate in having two married daughters, both living in Farmington, and four grandchildren.

Lonnie A. Coffin, M.D.

Although his practice keeps him busy, he has taken time for civic affairs, serving on the school board for 15 years, serving two terms on the city council, and taking an active part in the local post of the American Legion of which he was the first commander. In addition to being a member of the county and state medical societies and the American Medical Association, he is a member of the local Chamber of Commerce and the Iowa Academy of General Practice. He has served on the board of trustees of the Iowa State Medical Society and was its president in 1956. Although he calls himself just an ordinary country doctor his patients refuse to accept this designation. Their esteem for him was summed up by one who said, "There might be doctors who have done just as good and just as much—but none has done more any better."

LET US PUT AMEF "OVER THE TOP"

It is gratifying to learn that during 1957 the medical profession contributed more than four million dollars to medical education. Nearly one million dollars was contributed through the American Medical Education Foundation, with the balance consisting of direct grants or gifts to the schools or through their alumni organizations. In recent years there has been a steady increase in the number of physicians giving such financial assistance to the schools as well as in the total amounts made available through the American Medical Education Foundation or by direct gifts.

This is the time of year when final decisions must be made by all in regard to tax deductible contributions for 1958. There are only a few days left in which it is possible to make a gift in support of medical education through AMEF that will aid in bringing the contributions from the profession for 1958 to a new record. In order to achieve this new goal in support of the medical schools and for your convenience, The Journal has bound an envelope in the advertising pages in the back of this issue.

Please write out a check for your gift to medical education through the American Medical Education Foundation and forward it today in this envelope. Let us complete 1958 with a record support of medical education by the medical profession, a matter of professional pride, and a genuine challenge to others.

CHANGE OF ADDRESS

If you change your address please notify The Journal at least six weeks before the change is made. Include the address label clipped from your latest copy of The Journal, being sure to clearly state both your old and new address. If your city has Postal Zone Numbers, be sure to include this Zone Number in your new address.

ORGANIZATION SECTION

HIGHLIGHTS OF 12TH CLINICAL MEETING

Bold approach and action to bring improved medical care within the reach of more and more older persons highlighted House of Delegates actions early this month at the American Medical Association's 12th Clinical Meeting. The A. M. A. policy-making body of 198 Delegates made its stand clear through reports and resolutions (among 19 considered) covering aspects of low family income, indigent care, prepaid health insurance, "relative value schedules," and medical care plans. While all of these points reflect the medical profession's concern for personal health generally, the House actions in Minneapolis Dec. 4 showed a distinct emphasis on the health needs of a growing population of aged persons.

In other significant fields, the Delegates expressed their views on federal medical services, disaster preparedness, osteopathy, the "free choice of physician" principle, expansion of medical education facilities, and a re-examination of A. M. A. objectives and basic programs. Dr. Gunnar Gundersen of LaCrosse, Wis., President of the A. M. A., sounded the keynote for the meeting in his opening address Dec. 2 when he said:

> While we fight hard to preserve basic principles and objectives which are essential to good medical care, we also must be alert and adaptable to the changing times in which we live. . . . The time has passed for policies based on generalities, platitudes and flag-waving. The time has passed for medical crankiness, complaint, arrogance and pigheadedness—wherever they might exist. The time has passed when we can fight our battles simply by quoting George Washington, Thomas Jefferson and the rest of the founding fathers. . . .

Following Dr. Gundersen on the rostrum, Minnesota Governor Orville L. Freeman told the Delegates:

> You certainly have the right to oppose [Forand-type] legislation if you believe it would be harmful to your profession. You have the duty to oppose it if you believe it would be harmful to the public. But if you do oppose it you also have the responsibility of helping to work out an alternative program to meet the need that we all know exists and becomes more serious every day. . . . Senior citizens need better care.

Scope of Meeting

The year-end Clinical Meeting is designed to help the family physician meet his daily practice problems. This was accomplished in the Minneapolis Auditorium through reports from nearly 200 experts in various fields of medicine who brought him up to date on rapidly changing developments—and through 100 scientific exhibits, 130 technical exhibits, closed-circuit medical television (on a 9 by 12 ft. color screen), motion pictures, lectures, and panel discussions (including a conference via under-sea telephone cable with physicians in Southampton, England). The A. M. A. met previously in Minneapolis in 1928.

Registration included 2,658 physicians and 2,561 medical students, nurses, technicians, and guests—for a total official attendance of 5,219.

The General Practitioner of the Year award was presented to Dr. Lonnie A. Coffin, aged 68, of Farmington, Iowa. Except for two years of military service during World War I, he has been a key figure in his community for 44 years—delivering 2,500 babies (including 2,000 in the home), leading in civic and recreational activities, serving on the city council and the local school board, and playing vigorous roles in religious, veteran, and medical society affairs.

Earlier issues of THE JOURNAL carried some advance reports of the Clinical Meeting as well as brief statements of Trustees and officers. Future issues will contain an abstract of the proceedings, which eventually will be presented fully in pamphlet form. Following are summary high points of House of Delegates actions:

Oldsters, Fees, Insurance

The House adopted a report from its Council on Medical Service, urging that:

> . . . physicians everywhere expedite the development of an effective voluntary health insurance or prepayment program for the group over 65 with modest resources or low family income; that physicians agree to accept a level of compensation as full payment for medical service rendered to this group, which will permit the development of such insurance and prepayment plans at a reduced premium rate. This recommendation has been studied and restudied by the Board of Trustees, and has received its wholehearted endorsement.

In a related action, the House decided to face the "very important problem" of relative value studies. Relative value studies are not fee schedules. Rather, they are attempts to show (by unit or point designation) the relationship between time, competence, effort, experience, and other factors required to perform one professional service as compared with those required for other professional services. In accepting a Committee on Medical Practices report calling for relative value studies, the House of Delegates agreed that:

> Unless medicine does undertake this activity, it may be done by others who are less qualified. . . . The House of Delegates approves in principle the conducting of relative value studies by each constituent medical association rather than a nation-wide study or series of regional studies. . . . The nomenclature, descriptions and code numbers of the California Relative Value Study (almost identical with those of Kansas and Iowa) can well be accepted as a national format. . . . No unit values and/or dollar values are to be used or suggested.

The Delegates adopted a resolution authorizing the Council on Medical Service to sponsor "at the earliest practicable date" a Congress on Prepaid Health Insurance where plans may be formulated for "offering sound and constantly improving voluntary health insurance to the citizens of our nation." The House also approved a set of "Suggested Guides for Medical Society Sponsored Voluntary Prepayment Medical Benefit Plans."

On the matter of prepaid health insurance for elderly persons, the Delegates accepted a reference committee report which noted that Blue Shield Medical Care Plans "presently have a special committee studying seven distinct approaches to this problem. Many private insurance companies are also removing the 65-year age limit for benefits."

The House also recommended that Congress amend the Social Security Act to permit states to combine the present four public assistance medical programs into a single one.

Medical Care Plans Report

The long-awaited report of the 15-member Commission on Medical Care Plans was received without discussion on the floor of the House, although discussion at a reference committee hearing lasted for two hours. In deciding to defer action on the three and one-half year study until the Annual Meeting in Atlantic City next June, the Delegates noted that "the weight of testimony" in reference committee hearings "indicated that many members had not had an opportunity to study the report and, therefore, were unable to render an opinion at the present time." The House directed that, meanwhile, the Board of Trustees invite state medical associations to reply (by April 8 to Executive Vice-President F. J. L. Blasingame at A. M. A. headquarters in Chicago) to the following questions:

1. Acknowledging the importance of free choice of physician, is this concept to be considered a fundamental principle, incontrovertible, unalterable, and essential to good medical care without qualification?
2. What is or will be your attitude regarding physician participation in those systems of medical care which restrict free choice of physician?

The Commission suggested a definition of "freedom of choice" as "the right of the individual to exercise, without restraint, selection among alternatives." The Commission report adds: "The medical profession subscribes to, supports, and strives to attain complete acceptance and application of this principle of freedom of choice." The Commission's suggested definition of third parties was "mechanisms which, for any reason, enter into the relationship between the patient and his physician."

In its long study, the Commission on Medical Care Plans has explored the operation of various types of plans through which persons receive the services of physicians, the effect of these plans on quality and quantity of medical care, and the legal and ethical status of arrangements used by various plans.

Aleson Committee Report

The House accepted two recommendations, disapproved a third, and modified a fourth recommendation of its Committee to Study A. M. A. Objectives and Basic Programs. The Delegates also agreed with the special Committee, headed by Dr. Lewis Aleson of Los Angeles, that it should be disbanded. The Committee was appointed a year ago to modify recommendations which had their origin in the findings of a management consultant firm. Recommendations adopted this month in Minneapolis were that the Board of Trustees "give serious consideration to opening the publications of the Association to a free and open discussion of socioeconomic problems applicable to medicine" and that consideration be given to amending Article II of the A. M. A. constitution with the following substitution:

> The objectives of the Association are to promote the science and art of medicine and the betterment of public health and an understanding of the socioeconomic conditions which will facilitate the attainment of these objectives.

The Aleson Committee recommendation which was disapproved dealt with the proposed creation of a Council or Committee on Socioeconomics for a three-year period. The House decided this would not be necessary in the light of plans already under way to develop such a division based at A. M. A. headquarters.

Although the House accepted an Aleson Committee recommendation that the Board of Trustees "establish a mechanism which will assume the responsibility for promoting active liaison with each national medical society," a subsequent sentence was modified to read:

> In the scientific fields the role of the A. M. A. *should be primarily that of leadership*, but every endeavor should be made to bring about coordination of the special fields of scientific interest of the other national medical organizations.

Other House Decisions

The House of Delegates also made decisions on the following topics:

Fund Solicitations—Adopted a resolution requesting the Board of Trustees to arrange a "top-level conference" with voluntary health agencies, the United Funds, and other parties interested in the raising of funds for health causes—with the view of resolving "misinterpretations and other difficulties in this area."

Administrative Reorganization—Accepted and praised a Board of Trustees report which detailed a reorganization of the Headquarters staff into seven divisions and which noted that "extra effort is being made to coordinate the activities in the Washington and Chicago offices, and the over-all direction will come from Chicago."

Licensure of Paramedical Groups—Went on record as encouraging the voluntary registration of persons in fields allied to medicine who assist physicians, and opposed the extension of governmental licensure and governmental registration.

Osteopathy—Disapproved a resolution which would establish the sovereignty of relationships between medical societies and the osteopathic profession in their respective states. At the same time, the Delegates asked the Judicial Council to report next June, if possible, on past pronouncements of the House with respect to osteopaths and applicable state laws.

Amphetamines and Athletes—Authorized the Board of Trustees to allow continuation of a Committee study of this subject "in view of the complexity of the problem" and to submit a final report at the Atlantic City meeting.

Civil Defense—Adopted a resolution urging that:

—The A. M. A. recommend that discussions "be started with the view to developing a plan whereby reserve units and individuals can be used to supplement civil defense operations."

—Consideration be given "for the rapid training of civilians" to fill the places of medical reservists.

—A plan be explored for the recruitment, training, and use of former medical personnel who have no further military obligation "so that their services may be utilized for civil defense purposes."

Service Membership—Adopted a resolution of the Council on Constitution and Bylaws, urging that all county medical societies "make every effort" to provide a type of membership for armed forces, Public Health Service, and Veterans Administration physicians which will enable them to become active members of state medical associations and the A. M. A.

Social Security for Physicians—Recognized a resolution indicating that 45.7% of the membership of the Ohio State Medical Association replied "yes" last October to a survey question, "Should physicians be included in the federal social security program?" The House voted that detailed results of the poll be transmitted to the A. M. A. Board of Trustees "for its information and for the information of any of the Councils or Committees of the Association concerned with this matter."

Medicare—Noted curtailment of this federal program and recommended that "the A. M. A. encourage the re-establishment of services under the free choice principle to accomplish the original intent of the Medicare Act."

Poliomyelitis—Endorsed a Board of Trustees report called for renewed public education efforts to secure the minimum of three poliomyelitis vaccine injections.

Korean Children in U. S.—Urged that the Public Health Service, the State Department, and Congress be alerted that some Korean children adopted in the United States are suffering from communicable diseases which are antibiotic resistant and "increase the seriousness of this public health threat."

International Medical Year—Expressed support for a proposed International Medical Year, similar in purpose to the International Geophysical Year.

Commendation of Dr. Austin Smith—Heard Dr. John Galbraith of New York introduce the following resolution:

> WHEREAS, The House of Delegates of the American Medical Association has learned with great regret of the resignation of Dr. Austin Smith as Editor of THE JOURNAL of the American Medical Association; and
>
> WHEREAS, Dr. Smith has rendered outstanding service both to the American Medical Association and to the American public, in his former capacities as Secretary of the Council on Pharmacy and Chemistry, as Director of the Division of Research and more recently as Editor; and
>
> WHEREAS, the scientific activities of the American Medical Association are its most important functions; and
>
> WHEREAS, a scientist of the caliber of Dr. Smith will be most difficult to replace, therefore be it
>
> *Resolved,* by the House of Delegates of the American Medical Association assembled in Minneapolis December 2 to 4, 1958, that it expresses to Dr. Smith, first its sincere regret at his resignation; second, its gratitude and appreciation for his long years of devoted, loyal and efficient service; and third its best wishes to him for long life, health and happiness; and be it further
>
> *Resolved,* that this resolution be spread upon the minutes of the meeting, published in THE JOURNAL of the American Medical Association and a copy be sent to Dr. Smith.

Other Meeting Highlights

The Board of Trustees appointed Dr. W. Linwood Ball of Richmond, Va., as a Trustee for six months, to temporarily fill the vacancy created by the death last Nov. 19 of Dr. Warren W. Furey of Chicago. Dr. Ball will also continue to serve as A. M. A. Vice-President.

A conference on Federal Medical Services Dec. 1 covered such topics as medicare, education and research in veterans' medical care, and the future of Hometown Care Programs for veterans.

In a brief ceremony before the opening session of the House of Delegates, the American Medical Education Foundation received checks totaling $248,659. Later, the A. M. A. added its contribution of $100,000.

DR. AUSTIN SMITH RESIGNS

Dr. Austin Smith, Editor of THE JOURNAL since Dec. 1, 1949, has tendered his resignation and it was accepted by the Board of Trustees, effective Dec. 15th. Dr. Smith had served also as director of editorial policies for the A. M. A.'s nine monthly specialty journals. He joined the American Medical Association in February, 1940, as a medical consultant. In September, 1942, he was made secretary of the Council on Drugs and in 1946 was named, also, director of the Division of Therapy and Research.

Dr. F. J. L. Blasingame, the Executive Vice-President, said, "The American Medical Association accepts Dr. Smith's resignation with regret and is grateful to him for his many years of service. Every good wish is extended to him in the years ahead."

COUNCIL ON MEDICAL SERVICE

MEDICAL CARE FOR THE INDIGENT IN 1958

On June 15, 1957, the Committee on Indigent Care of the Council on Medical Service published in THE JOURNAL a series of 52 questions and answers concerning current legislation governing medical care programs for recipients of public assistance (old age assistance, aid to the blind, aid to the permanently and totally disabled, aid to dependent children). In October, 1957, and May, 1958, the Committee published Supplementary Reports 1 and 2 to that study, bringing the material up to date in the light of the 1956 and 1957 Social Security Amendments, effective July 1, 1957.

On Aug. 29, 1958, the President approved the 1958 Social Security Amendments (H. R. 13549), which again change the methods of financing and administering public assistance medical care, effective Oct. 1, 1958. The following report is therefore issued to inform the medical profession concerning the federal laws now governing public assistance medical care programs.

Background of Program

1. *How was medical care provided for public assistance clients prior to July 1, 1957?*

   The state was free to choose its own method. It could pay for public assistance medical care from public assistance funds, with limited federal participation in the cost, either as part of the money payment to the assistance recipient or, since 1950, through payments to the providers of medical services—"vendor payments." ("Medical services" is interpreted to include physicians and hospitals, nursing homes, pharmacists, dentists, and other auxiliary health services.) The state could also, if it so desired, provide medical services for its indigent entirely from state and local funds, using all the federally matched public assistance funds for money payments to the assistance recipients for their other basic needs.

2. *How did the 1956-1957 amendments, effective July 1, 1957, change this situation?*

   The 1956 amendments established a separate matching formula for vendor medical care payments, under which the federal government would reimburse half the state's expenditures, up to a maximum state expenditure of $6 per adult and $3 per child per month (average). All public assistance expenditures for medical care not included within these limits were subject to federal reimbursement only if spent as money payments to the assistance recipients.

   The 1957 amendments allowed the states to choose between this formula and the one in effect prior to July 1, 1957 (the effective date of the change).

3. *What were the results of these amendments?*

   Almost all states benefited financially from the separate matching formula. However, some states which had established relatively comprehensive medical care programs on a vendor payment basis found that, because of the $6 and $3 limitation, they would have to curtail the vendor portion of their programs to obtain maximum federal participations.

   Other states, in order to obtain the additional federal funds "earmarked" for public assistance vendor payments, found it necessary to revise their administrative operations.

   These amendments and the federal funds authorized did, however, encourage some states having no statewide public assistance medical care program to initiate a formal program for public assistance recipients with encouragement of these federal funds.

A. M. A. Policy

4. *Did the American Medical Association take a position on these amendments?*

   In December, 1956, the House of Delegates of the A. M. A. adopted the "Guides for Medical Societies in Developing Plans for Tax-Supported Personal Health Services for the Needy." This policy statement included the recommendation that the methods and amounts of payment for personal health services in such programs should be determined in conference between the responsible state and local government agencies and representatives of the providers. The new formula, by placing restrictions on federal funds for vendor medical care payments and requiring that all other public assistance funds be spent as money payments, in effect limited the state's freedom of decision as to the method of payment. In June, 1958, the A. M. A. House of

---

Members of the Committee on Indigent Care are Drs. John Flack Burton, Chairman, Oklahoma City; A. J. Bowles, Seattle; I. Jay Brightman, Albany, N. Y.; E. P. Coleman, Canton, Ill.; Wesley W. Hall, Reno, Nev.; E. A. Ockuly, Toledo, Ohio; Dean W. Roberts, Chicago; Mr. R. M. Hilliard, Consultant, Chicago; and Mr. Nelson B. Neff, Consultant, Reno, Nev. Staff members are Mr. George W. Cooley, Secretary, and Mr. James H. Fleming, Research Assistant.

Delegates reaffirmed its 1956 position and advocated the return to the states of all the decisions as to methods of payment.

5. *Are the 1958 amendments in accordance with this A. M. A. policy?*

Yes, insofar as they return to the individual state the decision as to the method of payment of public assistance funds for medical services.

Changes in Law

6. *Do the 1958 amendments merely cancel out the 1956 and 1957 changes in the law?*

No. There are changes in the maximum amounts eligible for federal matching, the method by which the total state expenditure eligible for matching is calculated, and the proportion of the cost to be met by the federal government. Several new items have also been added: Extension of the public assistance programs to Guam (not previously included), the authorization of payments to legal representatives of assistance recipients, and the establishment of a special Advisory Council on Public Assistance comprising representatives of employers, employees, program administrators, specially qualified persons, and the public. (These last two changes will not be discussed here, since information concerning them is insufficient to discuss their medical significance.)

7. *Will any of these changes directly affect indigent medical care programs?*

As the law now stands pending the issuance of any regulation changes by the Bureau of Public Assistance, Social Security Administration, Department of Health, Education, and Welfare, it appears that the medical care situation has been returned to its pre-1957 status. Each state can set up its program to use public assistance funds entirely for money payments, or for both money and vendor payments, with no financial advantage attached to either arrangement influencing its decision. However, since matching changes will probably bring more federal money into the programs in most states, there is a potential increase in the total state expenditures for public assistance which may lead to augmented medical services as well as increases in the basic maintenance budget.

8. *May expenditures still be made for medical care only?*

Yes. The federal law and regulations provide for participation in medical payments for persons who are in the categories covered by these programs and do not need a money payment, but who are eligible for public assistance because of inability to pay for medical care.

Matching Amounts

9. *What changes have been made in the determination of expenditures eligible for federal reimbursement?*

The maximum amount matchable per person has been changed in all four programs, and it is now based on average expenditures rather than on the actual amount expended for each individual.

10. *Is the "maximum amount matchable" the same as the amount of the federal share?*

No. The "maximum amount matchable" refers to the amount of state expenditures to which the matching formulas are applied. The federal government reimburses a portion of this cost; whatever is spent by the state over this limit receives no federal reimbursement.

11. *What is the maximum amount matchable per person under the new legislation?*

The federal government may participate in state expenditures up to a limit of $65 per person per month for recipients of aid to the aged, blind, and disabled, and up to $30 per person per month for recipients of aid to dependent children.

12. *How does this differ from the previous maximums?*

Prior to Oct. 1, 1958, there were actually two matching formulas. Under the basic formula, the federal government shared in the state's monthly expenditures up to a limit of $60 per person in the aid to the aged, blind, and disabled programs and up to a limit of $32 each for one dependent child and the adult responsible for his care and of $23 for each additional dependent child in the same home. Under the vendor medical care payment matching formula, the federal government shared in state expenditures up to a limit of $6 per adult and $3 per child.

If the state chose to utilize both formulas, the basic formula applied to money payments only and the $6-and-$3 formula to vendor payments only; if it did not utilize the $6-and-$3 formula, the basic formula applied to the combined money and vendor payments.

Averaging Provisions

13. *Are the new matching maximums applied to state expenditures in the same way as prior to Oct. 1, 1958?*

No. Prior to Oct. 1, the maximum in the basic formula was applied to each individual's money payment while the $6-and-$3 formula was based on the average vendor payment per person on the assistance rolls. Under the new amendments, all public assistance expenditures in a given program are averaged monthly against the total number of recipients in that program.

For example, under the earlier system, if one old age assistance recipient had a money payment of $40 and a vendor payment of $4 and another had a money payment of $80 and a vendor payment of $8, the money payments could not be averaged, but the vendor payments could if the $6-and-$3 formula were used. Thus, if both formulas were in use, $40 and $60 of the money payments would be eligible for federal matching under the basic formula and $6 and $6 (average of $4 and $8) under the vendor payment formula. If only the basic formula was in use in the state, the amounts eligible for federal matching would be $44 and $60.

Under the current law, all payments would be averaged ($44 plus $88 divided by 2 = $66) and $65 of this average payment would be eligible for matching.

14. *How will this affect the operation of "pooled funds" for medical services?*

For some years, a number of states have operated "pooled funds" set up to distribute medical expenses among all assistance recipients. In this system, a set amount from each recipient's grant is paid into a special fund for medical costs, while payments out of the fund are made in proportion to care provided. Thus, a recipient might receive a money payment of $55 and have $5 paid into the fund in his behalf, so that all expenditures in his behalf would come within the individual $60 maximum—and yet the recipient might have an amount much larger than $5 paid out of the fund for medical services he received.

Since the $6-and-$3 formula for vendor medical care payments was itself based on an averaging of medical expenditures against the total number of assistance recipients in a program, there was less reason for a "pooled fund" in most states utilizing this new formula.

Under the current law, since all public assistance expenditures, both money and vendor payments, are averaged for federal matching, there would appear to be few states which would gain any financial advantage by maintaining a "pooled fund." However, it may possibly provide administrative advantages in some states insofar as it would enable them to separate medical expenditures from other basic maintenance items and, perhaps, maintain a reserve to meet commitments with providers of services. There appears to be no legal obstacle to such a fund and a number of states are planning to continue using this mechanism.

15. *May expenditures under all four programs be combined and averaged against the total public assistance caseload?*

No. The four public assistance programs remain distinct entities, which may even be administered by different state agencies, and separate accounts must be maintained for each. A separate average expenditure must be calculated for each program.

Federal Participation

16. *Does the federal share of public assistance expenditures remain the same as under prior formulas?*

Only in those states which have a per capita income above the national average; in other states, the federal share will increase.

17. *What was the federal share of expenditures prior to Oct. 1, 1958?*

Under previous formulas for aid to the aged, blind, and disabled, the federal government reimbursed ⅘ of the first $30 expended per recipient by the state under the basic formula and ½ the remainder up to the individual matching maximum of $60. If the state also utilized the $6-and-$3 formula, the federal government reimbursed ½ the average vendor payment up to a state expenditure of $6 and participated in only so much of the basic $60 maximum as was made in the form of money payments.

For dependent children, the federal share was 14/17 of the first $17 per recipient plus half the remainder up to the maximums of $32 each for the first child and the caretaker in a home and $23 for each additional child. If the state also utilized the $6-and-$3 formula, the federal share was ½ the vendor medical care payments up to a state expenditure of $3 times the number of children and $6 times the number of adults on the ADC rolls. The basic formula would then apply only to money payments.

18. *How has the federal reimbursement been calculated since Oct. 1, 1958?*

The expenditures in each public assistance program, including both money and vendor payments, are totaled monthly and averaged against those receiving money payments plus those in whose behalf only vendor payments are made during that month. The first part of the formula for determining the federal share remains the same as prior to Oct. 1, 1958: The federal government repays state expenditures at ⅘ of the first $30 per recipient per month (average) in the aid to the aged, blind, and disabled programs, and at 14/17 of the first $17 per recipient of aid to dependent children. The second part of the formula, covering the federal share of average expenditures between $30 and $65 and between $17 and $30, the new maximums, is, however, no longer 50% for each state, but may vary from 50% to 65% of the state expenditure. This varying share is related to each state's per capita income, so that the poorer states receive a proportionately larger federal reimbursement.

19. *In how many states will the federal share be increased by this system?*

The federal government will pay more than the previous 50% in 33 states. In 19 states, it will pay the maximum percentage under the act, 65%.

Percentage of Federal Expenditure, by States, 1958-1961 Period (Promulgated by Secretary of Health, Education, and Welfare)

Alabama	65.00
Arizona	63.23
Arkansas	65.00
California	50.00
Colorado	53.42
Connecticut	50.00
Delaware	50.00
District of Columbia	50.00
Florida	59.68
Georgia	65.00
Idaho	65.00
Illinois	50.00
Indiana	50.00
Iowa	63.23
Kansas	60.78
Kentucky	65.00
Louisiana	65.00
Maine	65.00
Maryland	50.00
Massachusetts	50.00
Michigan	50.00
Minnesota	58.57
Mississippi	65.00
Missouri	53.42
Montana	54.07
Nebraska	63.41
Nevada	50.00
New Hampshire	57.91
New Jersey	50.00
New Mexico	65.00
New York	50.00
North Carolina	65.00
North Dakota	65.00
Ohio	50.00
Oklahoma	65.00
Oregon	52.58
Pennsylvania	50.00
Rhode Island	50.00
South Carolina	65.00
South Dakota	65.00
Tennessee	65.00
Texas	61.36
Utah	65.00
Vermont	65.00
Virginia	65.00
Washington	50.00
West Virginia	65.00
Wisconsin	54.60
Wyoming	50.92

20. *How is federal participation determined outside the continental United States and in Alaska?*

The law specifies that the federal percentage in Alaska and Hawaii shall be 50%, without regard to the per capita income.

In the Virgin Islands, Puerto Rico, and Guam (included in the program for the first time), federal participation is set at a flat 50% of monthly expenditures up to $35 times the number of recipients of aid to the aged, blind, and disabled, and $18 times the number of aid to dependent children recipients. The law also sets an annual limit on federal reimbursements for these three areas of $8,500,000 to Puerto Rico, $300,000 to the Virgin Islands, and $400,000 to Guam.

Effect on State Financing

21. *How will these new formulas affect the proportion of federal support for state programs?*

It seems probable that the combination of averaging expenditures and increasing federal participation for low income states will mean an increase in federal reimbursement in almost every state. The Bureau of Public Assistance estimates that, if state expenditures continue at their present levels, the increased federal share will amount to about 198 million dollars per year.

22. *Are any states likely to receive less federal reimbursement under the new formula?*

It would be possible, but appears unlikely in most states, since this loss could occur only in high income states which had been making maximum payments to each individual on the rolls.

Future Developments

23. *Has the medical profession taken any stand on increased federal participation in this program?*

No. As previously noted (question 4) the American Medical Association has stated that the method and amount of payment for medical services for the needy should be determined at the state or local level, and in conference with representatives of the providers of such services. In accordance with this policy, the A. M. A. has not found it appropriate to specify any level of funding as necessary or adequate either for indigent medical services or for the entire public assistance program. Such decisions should be made by local authorities on the basis of the local situation.

24. *What is the probable effect of these amendments on indigent medical care programs?*

Two factors may influence the development of such programs: The restored freedom of decision as to allocation of funds for the states, and the increased federal share in the costs in most states. The first factor will allow the individual states to increase or decrease their vendor payment programs as they will, without being influenced by concomitant increases and decreases in federal aid. This may result in the restoration of some vendor payment programs curtailed during the past year. It is unlikely that this freedom will cause the discontinuance of many programs unless there is continued strong local opposition, since few such programs are eliminated once begun.

The second factor, the increase in federal support, may lead to increase in public assistance programs, particularly among the low income states. It is difficult to predict which direction such increases may take, since there is pressure on some of these states to provide a more adequate payment to meet basic nonmedical costs. However, the greatly increased interest in medical care programs among state and local government officials generally, and among welfare officials in particular, may mean some increase in this type of service to the indigent.

Further Information

Since the Social Security Amendments of 1958 did not become law until Aug. 29, 1958, to become effective Oct. 1, 1958, there has, as yet, been little time for program planning by the various states. The Committee on Indigent Care of the Council on Medical Service will continue to report on significant changes as they occur; those desiring further information should write to the Council office, 535 North Dearborn Street, Chicago 10, Illinois.

NOTE: The 1958 amendments also affect the OASDI and Maternal and Child Welfare programs; changes in these programs are not included in this report.

MEDICAL NEWS

ARKANSAS

Dr. Riggin Wins Award.—Dr. John T. Riggin, associate dean of the University of Arkansas School of Medicine, Little Rock, has been given the first annual award of the Arkansas Conference of Tuberculosis Workers "for outstanding work in the control of tuberculosis in the state." He was given a plaque signifying his achievements and those of his colleagues in the establishment and operation of a chest clinic at the University Medical Center and for other statewide activities in the management of tuberculosis. The clinic, organized in July, 1956, provides a means for diagnosing and evaluating patients with suspected tuberculosis and gives outpatient clinic treatment to those not hospitalized in sanatoriums. The clinic provides follow-up care of patients released from sanatoriums and provides the mechanism for training medical students in the diagnosis and treatment of tuberculosis. Dr. Riggin reported that the clinic treated 876 patients in the first two years of its operation. Of these, 99 were referred and/or admitted to either the Booneville or McRae State Tuberculosis Sanatoriums. Another estimated 100 patients were given outpatient therapy at the Medical Center. The clinic sees only indigent patients except in those instances when private physicians refer patients to the Medical Center for specific diagnosis or treatment.

CALIFORNIA

Dr. Rytand Named Bloomfield Professor.—Dr. David A. Rytand was named the first Bloomfield Professor of Medicine at Stanford Medical School. The appointment was revealed at a Big Game reunion luncheon for medical alumni marking the school's 100th anniversary. The professorship honors Dr. Arthur L. Bloomfield, emeritus professor of medicine, who retired in 1954 and who is now engaged primarily in adding to his writings on internal medicine.

School of Medicine Consolidates in San Francisco.—For the first time since the earthquake and fire of 1906, the whole University of California School of Medicine is located at the University of California Medical Center, San Francisco. The freshman medical students who enrolled were the first to receive their basic instruction in anatomy, biochemistry, and physiology in the new, 14-story second unit of the Medical Sciences Building on the San Francisco campus. The first-year courses previously were given on the Berkeley campus, and the departments that teach them completed their move to San Francisco during the summer. This move permits the entire medical curriculum to be offered on a single campus and has made possible an increase from 78 to 100 in the first-year class. It also provides teaching and research space for other Medical Center departments, and it houses the Medical Center Library, and auditorium, and an animal tower. The new unit also provides additional teaching and research space for the School of Pharmacy, the division of oral biology of the School of Dentistry, the Cancer Research Institute, and the departments of medicine, microbiology, parasitology, pathology, pharmacology, and radiology in the School of Medicine. About 176,000 square feet of floor space are housed in the new Medical Sciences unit, which cost $5,773,649. Construction began in 1955. Another major teaching and research building is scheduled for construction beginning in 1960. To be called the Health Sciences Instruction and Research Building, it will extend toward Mt. Sutro from the rear of the Medical Sciences Building. The 10-million-dollar structure is designed to help many Medical Center departments.

COLORADO

Emergency Hospital Unit for Civil Defense.—A 200-bed civil defense emergency hospital was received by the University of Colorado Medical Center, Denver, from the federal government to expand facilities in the event of a civilian disaster and to serve training and educational purposes. Robert L. Denholm, Colorado University Medical Center administrator, said the unit weighs 13 tons and consists of more than 400 separate items. Delivered Nov. 17, the unit will be stored at the Medical Center and will be used to familiarize medical, nursing, and other personnel with its use. In the event of a civilian disaster, the hospital will be set up at the Medical Center and used on a temporary basis. The equipment received includes: a 15-kilowatt generator, a 1500-gallon nylon water storage tank and pump, three operating rooms, a clinical laboratory, x-ray facilities, a sterilizing unit, pharmacy, and central supply room.

CONNECTICUT

University News.—Dr. Kenneth D. Keele, consultant physician at the Ashford Hospital, Middlesex, England, was appointed visiting professor of the

---

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

history of medicine at the Yale School of Medicine, New Haven, and will be at Yale from October through December. He will work with Dr. John F. Fulton, Sterling Professor of the History of Medicine, in teaching medical and other university students in history of medical research. Dr. Keele is honorary secretary of the section on the history of medicine of the Royal Society of Medicine of London.

ILLINOIS

Hospital Lecture.—The fourth lecture in the ninth annual North Shore Hospital lecture series on "Emotional Forces in the Family" will be held at the hospital, 225 Sheridan Road, Winnetka, Jan. 7, 8:00 p. m. "The Role of Children in the Family" will be discussed by Dr. Sidney Berman, assistant clinical professor of psychiatry, George Washington School of Medicine, Washington, D. C. The Commission on Education of the American Academy of General Practice has approved these lectures for category II credit. All physicians and allied professional personnel are cordially invited to attend.

Personal.—The Illinois State Medical Society has announced that it has selected Dr. Mark Greer, of Vandalia, as the "Outstanding General Practitioner for 1959" and that a plaque emblematical of the honor will be presented to Dr. Greer at the annual meeting of the society in Chicago next May.——Dr. Arthur G. Baker, Pittsburgh, has been appointed director of Lake County Health Department. Previously Dr. Baker was director of the Allegheny County Health Department, served for two years as deputy director of the Pittsburgh Department of Health, and for five years was chief of the section of local health service in the Michigan Department of Public Health.

Chicago

New Building for Medical Center.—An addition to Chicago's West Side Medical Center has begun and Dr. John J. Sheinin, president of Chicago Medical School, has announced that the 10-story, block long, 110,000-square-foot building will be erected at a cost of 4 million dollars. It will have complete facilities for intensive research in biophysics, behavioral science, infectious disease, allergy arthritis, experimental surgery, experimental medicine, metabolism, endocrinology, biochemistry, hematology, cardiology, and oncology. Completion of this new building, the first of the Chicago Medical School's 10-acre campus of buildings, is scheduled for the fall of 1960. The new campus is being developed to include a College of Physicians and Surgeons, a research hospital, nurses' residence, student quarters, and faculty housing. When the new institute is completed it will provide research facilities for over 400 scientists, doctors, technicians, and postgraduate students. The new building will be air conditioned, with special climate control in the animal quarters, and is being provided with pneumatic tube systems and closed circuit TV. Large seminar rooms and exhibit halls will be on the first floor.

INDIANA

Annual Lecture Series.—The Alpha Tau Chapter of the Phi Delta Epsilon Fraternity will hold its annual lectureship series Jan. 30 in the Indiana University School of Medicine Auditorium, Indianapolis. The guest speaker will be Dr. Thomas Gucker, III, medical supervisor of the Rehabilitation Center of the Orthopaedic Hospital of Los Angeles and associated with the faculty of the University of Southern California. His subject is "Rehabilitation—Points of Emphasis."

MAINE

Laboratory Dedicated to Hospital Pathologist.—The Maine Medical Center honored Maine General Hospital's first pathologist, Mortimer Warren, by dedicating its remodeled and enlarged laboratory in his name. Dr. Warren became the first full-time pathologist at the hospital in 1922 and was still active at the time of his death in 1944. The medical staff in donating money to help remodel the laboratory voted to name it in his honor "for his outstanding service to the hospital, his profession and the people of Maine."

MASSACHUSETTS

Medical History Meeting.—The Benjamin Waterhouse Medical History Society will meet at the Massachusetts Memorial Hospital, Boston, Jan. 5, when Donald H. Fleming, Ph.D., visiting professor of history, Harvard University, and professor of the history of science, Yale University, will speak on "Inoculation Controversy of 1721." Reservation for dinner may be made by calling KE 6-8600. All interested are invited to attend the medical history session.

New Building for Mental Patients.—Medfield State Hospital played host on a tour of the new George O. Clark Reception Building. Built at a cost of $2,250,000, the four-story building is designed for the care of mental patients. The main feature is that it centralizes the admission department, the medical and surgical unit, social service, and continued treatment. The new structure will house 196 patients. This is Medfield State Hospital's first new building since 1914. The Clark Building has two complete operating rooms; a physiotherapy laboratory; ear, nose, and throat, eye and foot clinics; cystoscopic room; pharmacy; x-ray laboratory; and electroshock and insulin treatment suites. The building is named for Dr. George O. Clark, who served 36 years as trustee and as chairman of Medfield State Hospital's board of trustees from 1939 to 1948.

Anniversary for Psychoanalytic Society.—The 25th anniversary of the founding of the Boston Psychoanalytic Society and Institute was held Nov. 30 in Boston. The creative role played by Boston psychoanalysts in the development in the United States of their specialty was featured in an afternoon and evening program, and the relations of the society and institute to the Harvard Medical School and the Boston University School of Medicine, to mental and general hospitals in the Boston area, to child psychiatry, social work, and to the social sciences generally were discussed.

MICHIGAN

Plans Announced for Research Building.—Construction of a $2,500,000 Research Building which will be owned jointly by University Hospitals and Western Reserve University School of Medicine is tentatively set for next summer. This will be the first major expansion of research facilities in more than 30 years. The building was made possible through grants from the U. S. Public Health Service, the Hanna Fund, and Republic Steel. Containing about 100,000 square feet, it will be used principally by the departments of medicine and preventive medicine. The L-shaped building will extend east from Lakeside Hospital. The entire building will have two floors underground, and the main stem will be three stories high and the wing will be four stories. The Public Health Service grant amounted to $1,253,686 and was equaled by private gifts. Republic Steel contributed $40,000 and the Hanna Fund pledged the balance. A second grant of $376,245 is to be used for the remodeling of the School of Medicine. This includes air conditioning the entire building and modernizing research laboratories of the basic science departments. Dr. Joseph T. Wearn, dean of Western Reserve University School of Medicine, said that funds are needed to match this sum.

Kenny Hospital and Rehabilitation Institute Affiliate.—The Elizabeth Kenny Foundation has moved its in-patient facilities to the recently completed $3,500,000 Rehabilitation Institute of Metropolitan Detroit, 261 Brady Street, adjacent to Harper Hospital, according to a joint announcement by E. J. Rollings, executive vice-president of the foundation's Michigan chapter, and Dr. Joseph N. Schaeffer, director of RIMD. The move climaxes an expanding rehabilitation program which the Kenny Foundation has supported, both nationally and locally, for the past several years. In addition to polio, a growing emphasis has been placed on helping victims of other crippling and degenerative diseases. Rehabilitation of the chronically ill and disabled, which number 57,000 in the Detroit area, will be a unified objective of both RIMD and the Elizabeth Kenny Foundation. Services include Rehabilitation Nursing, Physical Therapy, Occupational Therapy, Speech and Hearing, Activities of Daily Living, Medical Social Services, Vocational Counseling, and Psychological Services. Associated with Wayne State University College of Medicine, RIMD will also serve as a training center for doctors, nurses, therapists, psychologists, social workers, and other rehabilitation personnel. The Elizabeth Kenny Hospital has been located in Farmington since 1953. All in-patients and necessary hospital equipment were transferred to the new quarters of RIMD on September 11. The Kenny Foundation, which is supported by the United Foundation and the Michigan United Fund, will continue to operate its new out-patient facility in Ferndale, Mich.

MINNESOTA

Dr. Magath Honored by Clinical Pathologists.—Dr. Thomas B. Magath, head of the section of clinical pathology of the Mayo Clinic from 1946 to 1958, and professor of pathology in the Mayo Foundation, was honored Nov. 4 in Chicago at a dinner meeting of the American Society of Clinical Patholgists and the College of American Pathologists. Dr. Magath received the Ward Burdick award of the American Society of Clinical Pathologists, described as "a gold medal which shall be presented to that Fellow who, in the opinion of the Research Committee, has presented the most meritorious contributions to the science of clinical pathology." Dr. Magath has served as president of the society, the Minnesota State Board of Health, and the Minnesota Academy of Science.

NEBRASKA

Meeting on Indian Health.—Indian health was discussed when Creighton University medical and dental faculty members met with Indian medical, dental, and pharmacy officers from a six-state area Nov. 13-14. Present were Dr. Joseph H. Gerber, medical officer for the Aberdeen Area, Division of Indian Health, U. S. Public Health Service, and members of the Aberdeen Area Medical, Dental and Pharmacy Officers Association, including Dr. Emery A. Johnson, Winnebago, association president. The Aberdeen area includes Nebraska, North Dakota, South Dakota, Minnesota, Iowa, and Wisconsin. The program featured Benjamin L. Lynch, D.D.S., dean of the Creighton University School of Dentistry; Dr. Benedict R. Walske, professor of surgery, Creighton School of Medicine; Dr. Robert P. Heaney, assistant professor of medicine; Dr. Harold Ladwig, assistant professor of neurology; Dr. Robert J. Luby, instructor in obstetrics and gynecology; and Dr. John R. Mitchell, assistant professor of pediatrics. Dr. Richard L. Egen, assistant dean, School of Medicine, spoke at the group's banquet in Sioux City Nov. 13. The two-day continuing education program for health officers was related to the referral system between the Winnebago Indian Hospital, which is diagnostic center for the Aberdeen Area, and Creighton University School of Medicine, Omaha. This system, in conjunction with the United States Public Health Service, helps care for indigent Indians in the area.

NEW YORK

Dr. Duthie Comes to Rochester.—Dr. Robert B. Duthie, of the Institute of Orthopedics, Royal National Orthopedic Hospital, in London, England, has been appointed professor of orthopedic surgery and head of the division at the University of Rochester School of Medicine and Dentistry. Dr. Duthie, who began his new duties on Oct. 1, has had clinical, teaching, and research experience in England, Scotland, and Malaya, where he was on active military service from 1949-51 as a captain in the Royal Army Medical Corps. He received the advanced degree of Master of Surgery with distinction from the University of Edinburgh in 1956, when he was awarded the gold medal for his thesis, "The Histochemistry of the Organic Phase of Postfoetal Osteogenesis." Last year he received the President's Prize of the Societe Internationale de Chirurgie for his experimental work on osteogenesis. Dr. Frederick N. Zuck, associate professor of orthopedic surgery, acting head of the division since the retirement of Dr. Russell P. Schwartz last year, continues as vice-chairman.

New York City

Orchestras for Doctors.—Physicians, dentists, and members of allied professions are invited to become members of two orchestras in New York City. Nonmedical musicians may also join. The Doctors' Orchestral Society of New York rehearses Thursday evenings in the auditorium of the Stuyvesant High School, 15th Street and First Avenue, New York City, at 8:30 p. m. The Brooklyn Doctors' Symphony meets Wednesday evenings in the auditorium of the Brooklyn High School of Home Making at 901 Classon Ave., corner of Washington Avenue, Brooklyn, at the same time. For information write Dr. Benjamin A. Rosenberg, 909 President St., Brooklyn 15: NEvins 8-2370.

Invite Exhibits for Health Exposition.—Manufacturers of drug and medical products, sanitary aids, foods, and other health-related products and services are being invited to participate in the second annual Health Exposition, a health education project of the New York City Department of Health, to be held in the New York Coliseum Aug. 5-15, 1959. The Advisory Council is headed by Morey F. Fields, Ed.D., director of Public Health Education for the New York City Department of Health. An attendance survey at the 1958 show revealed that visitors enjoyed unusual and dramatic exhibits which told an important story. Many of the people interviewed said they would like to see more demonstrations and tests, and more action with either animals or humans participating. For information write the City of New York Department of Health, 125 Worth St., New York 13.

Study of Gastric Cancer.—The New York City Department of Health, five hospitals, and a medical group are conducting a study of gastric cancer involving more than 6,000 persons. The department, hospitals, and group have already examined more than 6,000 selected persons for gastric acidity and found that more than 1,000 of those examined had little or no acid in their gastric juice. Previous studies showed that persons with little or no gastric acidity are three to four times more likely to develop gastric cancer than are persons with normal levels of acidity. The investigators will follow up each of those persons who were found to have little or no gastric acidity to determine whether they will develop cancer. This follow up will take three to five years. The study is being directed by the Bureau of Adult Hygiene of the Department of Health, of which Dr. Abraham Oppenheim is director. Those participating in the investigation are Beth El, Beth Israel, Brooklyn Jewish, Mt. Sinai, and Polyclinic hospitals, the Pack Medical Group, and the New York City Health Department's East Harlem Cancer Prevention-Detection Center. The Pack Medical Group is an organization of private physicians who specialize in cancer.

Dedicate General Hospital.—The new 9-million-dollar Misericordia General Hospital at 600 E. 233rd Street, Bronx, was dedicated Sept. 7, 3:00 p. m. Francis Cardinal Spellman, Mayor Robert F. Wagner, and Bronx Borough President, James J. Lyons, participated in the ceremonies. The new plant will serve the Bronx and lower Westchester. It replaces the original Misericordia Hospital at 531 E. 86th Street, Manhattan, founded by the Sisters of Misericorde 70 years ago. The hospital includes a seven-story general hospital building of 210 beds, a six-story nursing school and residence for 150 nurses, and a three-story shelter for unmarried mothers. On the ground floor of the main building are services facilities. Administrative offices, intern quarters, admitting office, and medical records library occupy the first floor. Outpatient departments, laboratories, and x-ray and emergency departments are located on the second floor. The third floor contains the air-conditioned surgical suite with 74 beds and equipment for all specialized types of surgery. The department of surgery will have a teaching affiliation with the Bronx Municipal Hospital and the Albert Einstein College of Medicine. The obstetrical suite occupies the south wing and central area of the fourth floor, and the north wing provides 40 beds for gynecological patients. On the fifth floor are 43 patient beds and an 18-bed pediatrics department, together with the department of medicine, research laboratory, and the central sterile supply section for the entire hospital. The sixth and seventh floors contain the chapel and convent. Misericordia Hospital is one of 15 general hospitals of the archdiocese affiliated with the Department of Health and Hospitals of New York Catholic Charities.

NORTH CAROLINA

Fatalities from Fires in 1957.—One-hundred and ninety-seven North Carolinians lost their lives in fires in 1957. Burns and other deaths associated with fire are the second most important cause of accidental death in the home, outranked only by falls. Normally, deaths due to burns in North Carolina as well as nationally occur most frequently among persons 65 years of age and older, but, in the state in 1957 more than 33% of the fatal fire accidents involved children under 15 years of age, and most of these were in the preschool age group.

OREGON

New Trudeau Society.—The Oregon Trudeau Society was organized on May 14 as the medical section of the Oregon Tuberculosis and Health Association. The following officers were elected: president, Dr. William Cohen, Portland; president-elect, Dr. Donald E. Olson, Portland; secretary-treasurer, Dr. Walter A. Noehren, Sandy. This brings the number of state Trudeau societies to 38.

VIRGINIA

Dr. Leavell Named Assistant Dean.—Dr. Byrd S. Leavell was named assistant dean of the University of Virginia School of Medicine, Charlottesville. He will succeed Dr. Henry B. Mulholland, who retired at the age of 65. Dr. Mulholland will continue his medical practice and teaching duties as professor of internal medicine.

GENERAL

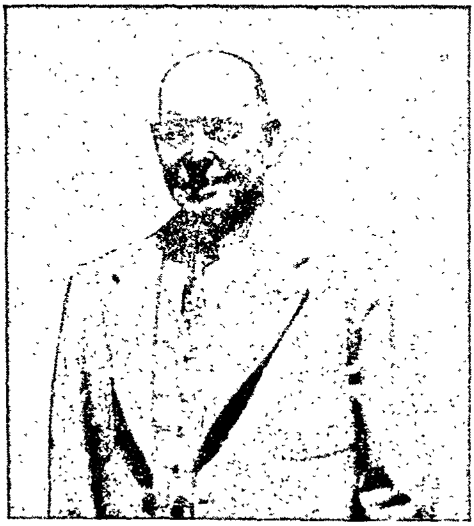
Poison Control Centers.—The American Association of Poison Control Centers was formed in Chicago Oct. 21. Officers elected were as follows: president, Dr. Robert J. Grayson, organizer of the poison control center, Jackson Memorial Hospital, University of Miami School of Medicine; vice-president, Dr. William C. Adams, University of Louisville School of Medicine; and secretary-treasurer, Harry W. Raybin, New York City Department of Health. Membership in the organization is open to persons and organizations interested in poison control programs. The group will have as its aims the stimulation of scientific research and education on toxic substances, assistance to state and local officials and to voluntary agencies in the field of poison control, setting up standards for operation of poison control centers, the provision of information to the public, and the development of information services, insurance liability programs in this area, and warning leaflets.

Child Growth.—Today's children are taller and heavier than those of a generation ago, according to statisticians of the Metropolitan Life Insurance Company. Comparison of measurements for Michigan children made recently with those in 1937-1939 shows consistently higher figures for today's children. Among boys under 9, average heights were greater by a fraction of an inch, and at ages 9 and over by an inch or more. Among girls the difference was an inch as early as age 8. The increase in average weight ranged from more than 2 pounds at age 7 to as much as 13 pounds at age 14. According to statisticians, moreover, the ultimate adult height has increased gradually. Evidence for this is available from data on adults in successive age groups, from father-son and mother-daughter comparisons of college entrants, from Selective Service data for the two World Wars, and from comparative figures on conscripts in various European countries.

Three Researchers Win Nobel Prize in Medicine.—The 1958 Nobel Prize in Medicine has been presented to George Wells Beadle, D.Sc., Pasadena, Calif. and Edward Lawrie Tatum, Ph.D., New York City (jointly), and Dr. Joshua Lederberg, Ph.D., Madison, Wis. Half of the $41,250 award was given to Dr. Beadle, of the California Institute of Technology, and Dr. Tatum, of the Rockefeller Institute, who until last year was at Stanford University, San Francisco. The other half of the prize went to Dr. Lederberg, chairman of the department of medical genetics, University of Wisconsin School of Medicine. Next April he will head a new department of genetics at Stanford University School of Medicine. Drs. Beadle and Tatum reportedly established the new field of biochemical genetics. Dr. Lederberg is known for his discovery that certain types of bacteria reproduce by fusing together. In 1946 Drs. Tatum and Lederberg together received acclaim for their discovery of bi-parental inheritance and sexual reproduction in bacteria strains.

Society News.—The officers of the American Society for the Study of Arteriosclerosis are as follows: president, Dr. James C. Paterson, London, Ontario, Canada; vice-president, Forrest E. Kendall, Ph.D., Welfare Island, New York City; secretary-treasurer, Dr. Otakar J. Pollak, P. O. Box 228, Dover, Del.—The new officers of the American Association for the Surgery of Trauma are Drs. Truman G. Blocker Jr., Galveston, Texas, president; James K. Stack, Chicago, president-elect; Harrison L. McLaughlin, New York City, vice-president; William T. Fitts Jr., Philadelphia, secretary; Raymond Householder, Chicago, treasurer; and Preston A. Wade, New York City, recorder.——The new slate of officers for the **Western Industrial Medical Association, Inc.,** for 1958-1959 is: president, Dr. Edward J. Zaik, Los Angeles; vice-president, Dr. Verne G. Ghormley, Fresno, Calif.; secretary, Dr. Avon C. Remington, Los Angeles; treasurer, Dr. Clarence L. Lloyd, Los Angeles; assistant secretary, Miss Esther Klingsheim, Los Angeles; and assistant treasurer, Mrs. Olga Wolf, Los Angeles.

Wanted by the FBI.—The Federal Bureau of Investigation requests the cooperation of all physicians in the United States in locating Martin L. Manson, who was indicted by the Federal Grand Jury at Los Angeles Feb. 25, 1953, for violation of the National Bankruptcy Act, and who may be under treatment for a tumor. For years Manson operated a tailor shop in Santa Barbara under the firm name of "Martin's." He also established several dry cleaning shops and either abandoned or closed them after a few months, moving to new locations.


Martin L. Manson.

Manson, according to the FBI, is white, 69 years old, 5 ft. 7½ in. tall, weighs about 170 lbs., is portly, has light blue eyes, mixed grey and brown hair, thin on top. He lists his occupation as a tailor, and is proud, boastful, and self-assertive. He is married and has a daughter.

Manson is known to have used the following aliases: Martin Luther Manson, Martin Leonard Manson, Bill Billinger, Martin Martinez, Rue Max Adams, Rue Leonard Adams, L. Martin, M. Leonard, Martin Leonard, Leo Leonard.

Any person having information which might assist in locating this fugitive is requested to immediately notify the Director of the Federal Bureau of Investigation, U. S. Department of Justice, Washington 25, D. C., or the Special Agent in Charge of the nearest FBI Division, the telephone number of which is on the first page of local telephone directories.

Award Honors Elizabeth Blackwell.—Mrs. William Larimer Mellon Jr., of Deschapelles, Haiti, received the first Elizabeth Blackwell award of Hobart and William Smith Colleges, Geneva, N. Y., for "outstanding service to mankind." The award was made by the Rev. Dr. Louis M. Hirshson, president of the colleges, at a special convocation to celebrate the 50th anniversary of the founding of William Smith College for women. It is named to commemorate the life and works of Elizabeth Blackwell, reportedly the first woman doctor in the world, who received her M.D. degree from the medical department of Hobart (then Geneva) College in 1849. The award is a simple gold medal, somewhat larger than a silver dollar. Gwen Grant Mellon, with her husband, Dr. William L. Mellon Jr., established the 75-bed Hospital Albert Schweitzer at Deschapelles, Haiti, in 1956 to serve the hundreds of thousands of people in the 600 square miles of the valley of the Artibonite River. Cost of the hospital, in excess of 2 million dollars, and an annual operating deficit in excess of $250,000 are paid for by the Grant Foundation, a Pennsylvania nonprofit corporation established by Dr. Mellon in honor of his wife, whose maiden name was Grant. Additional gifts to the foundation and its work are received from people all over the world, but its principal source of income has been Dr. and Mrs. Mellon.

Psychiatrists Dedicate Office Building.—The dedication of a new central office building in Washington, D. C., for the American Psychiatric Association was held Oct. 31. Secretary of Health, Education and Welfare Arthur S. Flemming gave the dedicatory address. The American Psychiatric Association was founded in 1844 by 13 physicians under the title Association of Medical Superintendents of American Institutions for the Insane. In 1892, by which time it had about 250 members, the name was changed to the American Medico-Psychological Association. In 1921, when it had 1,000 members, it assumed its present title. By 1950 the association's membership had grown to 6,000; this year it passed the 10,000 mark. The new $300,000 headquarters is a converted town house, owned outrightly by the American Psychiatric Association and made possible by voluntary contributions from its members. It houses a staff of 35. The association provides a wide range of information and consultation services to state governments on mental health and hospital problems; it inspects, rates, and sets standards for mental hospitals; it publishes the *American Journal of Psychiatry*, the magazine, *Mental Hospitals*, and other professional books, reports, and proceedings; it issues the official Nomenclature for Mental Disorders; it administrates special research and conference projects; it furnished information to the public about psychiatry. It is a nonprofit association. The medical director, Dr. Mathew Ross, is the senior staff employee of the association. He took office in September this year, succeeding Dr. Daniel Blain.

CORRECTION

Licensed Foreign-Trained Physicians.—Table 29 entitled "Foreign-Trained Physicians Licensed by State Boards, 1952-1957," published in the State Board Number of The Journal, May 31, 1958, page 622, reported incorrect figures for the year 1956. The total for the fifth column entitled "Examination" for the year 1956 should have been 1,012. This likewise changes the total column in this section to 5,786 and the grand total to 6,738. The figures given for each state are incorrect and anyone referring to this table should consult the Council on Medical Education and Hospitals for the correct figures for each state.

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Oral.* Phoenix, April 5-10. All applications already on file. Sec., Dr. Forrest E. Leffingwell, 217 Farmington Ave., Hartford 5, Conn.

American Board of Dermatology: *Written.* Several Cities, Oct. 5. *Oral.* Oklahoma City, Jan. 15-18, 1960. The final date for filing all applications is July 1, 1959. Sec., Dr. Beatrice M. Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *1959 Schedule—Written,* Oct. 19. Final date for filing application is May 1. *Oral. For candidates in the South and Southwest,* New Orleans, Feb. 3-6. Final date for filing application is Jan. 1. *Oral.* For candidates in the Midwest. Chicago, April 15-18. Final date for filing application is Jan. 1. *Oral.* For candidates on the West Coast. Final date for filing application is March 1. *Oral.* For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology. Philadelphia, April 17-18. Final date for filing application* is Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. *In order to* be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: *Part I.* Various parts of the United States and Canada, January 16. Candidates notified of their eligibility to participate in Part I must submit their case abstracts within thirty days of notification of eligibility. No candidate may take the written examination unless the case abstracts have been received in the office of the Secretary. *Oral and Clinical.* Chicago, May 8-19. Formal notice of the exact time of each candidate's examination will be sent him in advance of the *examination dates. Candidates* who participated in the Part I examinations will be notified of their eligibility for the Part II examinations as soon as possible. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), Various Cities, Jan. 26. *Oral.* Philadelphia, June 2; St. Louis, Oct. 6-10. Sec., Dr. Merrill J. King, 22 White St., Rockland, Maine.

American Board of Orthopaedic Surgery: *Part I.* Washington, D. C., Denver, Colorado and Rochester, Minn., Mar. 26-27. Deadline for filing application was Nov. 30. *Part II.* Chicago, Jan. 21-23, 1959. Deadline for receipt of applications was Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 5-9. Final date for filing application is February. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pathology: Boston, April 16-19. Final date for filing application is Feb. 28. Sec., Dr. Edward B. Smith, 1100 W. Michigan St., Indianapolis 7.

American Board of Physical Medicine and Rehabilitation: *Written, Part I,* and *Oral, Part II.* Philadelphia, June 12-13. Final date for filing application is February 15. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

American Board of Plastic Surgery: *Oral and Written.* Boston, May 9-11. Final date for submitting case reports is Jan. 1. Corresponding Secretary, Miss Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8, Mo.

American Board of Preventive Medicine: *Written. Public Health.* Regional, Apr. 9-11. *Occupational Medicine.* Chicago, Apr. 17-19. *Aviation Medicine.* Los Angeles, Apr. 24-26. Final date for filing application for all three examinations is Jan. 15. Sec., Dr. Tom F. Whayne, 3438 Walnut St., Philadelphia 4.

American Board of Proctology: *Oral and Written.* Philadelphia, September. Final date for filing application is March. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden *City, N. Y.*

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Special Examination.* Cincinnati, Mar. 16-19, 1959. Final date for filing application was Nov. 1. Candidates completing training June 30, 1959 are not eligible for the Spring 1959 examinations. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: *Part II.* Houston, Tex., Jan. 12-13; New Haven, Conn., Feb. 9-10; Durham, No. Car.; March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: *Oral.* Los Angeles, April. Final date for filing application is Dec. 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

American Board of Urology: The oral will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

DEATHS

Andes, T. Eugene, Gardner, Mass.; Temple University School of Medicine, Philadelphia, 1940; member of the Massachusetts Medical Society and the American Psychiatric Association; certified by the National Board of Medical Examiners; veteran of World War II; served on staffs of hospitals in Harrisburg, Pa., Martinsburg, W. Va., Morganton, N. C., and Lakeland, Ky.; served as assistant superintendent of Gardner (Mass.) State Hospital; died in the Temple University Hospital, Philadelphia, Oct. 10, aged 44, of pulmonary emphysema.

Aszuk, Joseph Charles Ⓜ Wilkes-Barre, Pa.; Temple University School of Medicine, Philadelphia, 1926; veteran of World War I; from 1928 to 1951 on the staff of Mercy Hospital and since 1951 on the staff of the Veterans Administration Hospital, where he died Oct. 18, aged 62, of carcinoma of the bladder.

Bachmann, George William, Smith River, Calif.; University of Buffalo School of Medicine, 1906; veteran of the Spanish-American War; died Sept. 20, aged 79, of a heart attack.

Bernard, Louis Emile Ⓜ Croton-on-Hudson, N. Y.; born in 1898; University of Montreal Faculty of Medicine, Montreal, Que., Canada, 1925; Long Island College Hospital, Brooklyn, 1931; fellow of the American Psychiatric Association; served an internship at the Kings Park (N. Y.) State Hospital and a residency at the Rockland State Hospital in Orangeburg; member of the Association for the Advancement of Psychotherapy, New York Society for Clinical Psychiatry, the Bronx Society of Neurology and Psychiatry, the Westchester Academy of Medicine, and New Jersey Neuropsychiatric Society; served on the staff of the Croton Manor Sanitarium; owner and director of the Stony Lodge in Ossining; consulting psychiatrist at Phelps Memorial Hospital in North Tarrytown, where he died Oct. 23, aged 60.

Beyer, John Andrew II Ⓜ Madison, Wis.; born in Dover, N. J., March 11, 1921; Columbia University College of Physicians and Surgeons, New York City, 1945; interned at the New York Post-Graduate Medical School in New York City and served a fellowship in internal medicine at the New York Hospital; certified by the National Board of Medical Examiners and the American Board of Internal Medicine; instructor of pharmacology at his alma mater from 1946 to 1948; an associate of the American College of Physicians; member of the American Federation for Clinical Research and the Wisconsin Heart Association; member of the Kiddie Camp Convalescent Home for Rheumatic Heart Disease; member of the mobile clinics, Wisconsin Heart Association; member of the board and house physician, Oakwood Lutheran Home; consulting cardiologist, Visiting Nurse Service; member of the staff and chairman of the records committee, Madison General Hospital; director, rheumatic fever clinic, St. Mary's Hospital; chief, cardiovascular section, and captain, U. S. Army Medical Corps, Percy Jones Army Hospital, Battle Creek, Mich., from 1951 to 1953; died in Sioux Falls, S. D., Oct. 18, aged 37, of injuries received in an automobile accident.

Blaine, Edward Smith Ⓜ Los Angeles; Milwaukee Medical College, 1911; served on the faculty of Marquette University School of Medicine in Milwaukee, Northwestern University Medical School in Chicago, and the College of Medical Evangelists in Loma Linda and Los Angeles; specialist certified by the American Board of Radiology; veteran of World War I; died at his home in San Marino, Calif., Oct. 8, aged 75.

Boericke, Oscar Eugene, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1898; an associate member of the American Medical Association; served on the faculty of his alma mater; died Oct. 16, aged 86.

Brown, Joseph Nichols, Campti, La.; Hospital College of Medicine, Louisville, Ky., 1906; member of the Louisiana State Medical Society; past-president of the Natchitoches Parish Medical Association; died in Shreveport Oct. 10, aged 81.

Burch, Newnan Burgess, Hot Springs National Park, Ark.; University of Tennessee College of Medicine, Memphis, 1917; for many years associated with the Wade Clinic; owner of the Burch Clinic; died in the Ochsner Foundation Clinic in New Orleans, Oct. 13, aged 71.

Burke, Joseph Peter, Scranton, Pa.; Georgetown University School of Medicine, Washington, D. C., 1913; veteran of World War I; on the staffs of State, Mercy, and St. Mary's hospitals; died in the Veterans Administration Hospital in Wilkes-Barre Oct. 18, aged 75, of asthma.

Burleson, William Brown Ⓜ Plumtree, N. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1915; died Oct. 2, aged 76.

Ⓜ Indicates Member of the American Medical Association.

Butler, Harry M., Hutchinson, Kan.; Ensworth Medical College, St. Joseph, Mo., 1905; served on the staffs of the Hadley Memorial and St. Anthony's hospitals in Hays; died in the Grace Hospital Oct. 10, aged 81, of pneumonia.

Carman, John Thomas, Franklin, Ky.; University of Tennessee Medical Department, Nashville, 1898; an associate member of the American Medical Association; died in the Carter Moore Hospital Oct. 1, aged 88, of heart disease and a fractured hip as the result of a fall.

Charles, Thomas Goodell Ⓜ Beardstown, Ill.; Northwestern University Medical School, Chicago, 1909; chairman of the Beardstown Board of Health; veteran of World War I; died in St. Luke's Hospital, St. Louis, Oct. 10, aged 71.

Chenoweth, Laurence Benjamin Ⓜ Cincinnati; Johns Hopkins University School of Medicine, Baltimore, 1919; served on the faculty of the Cornell University in Ithaca, N. Y., and as director of the department of hygiene and student health service, University of Cincinnati; past-president of the American College Health Association; for three years president of the Phi Epsilon Kappa; joint author of "School Problems," "Personal Hygiene," and other books on hygiene and health; died Oct. 17, aged 67, of coronary occlusion and arteriosclerotic heart disease.

Close, John Harry Ⓜ Minersville, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1935; interned at the Harrisburg (Pa.) Hospital; died in the A. C. Milliken Hospital in Pottsville Sept. 24, aged 51, of hypertensive heart disease.

Coffee, John Young Jr. Ⓜ Huntsville, Ala.; Medical College of Georgia, Augusta, 1947; served in the Korean War and World War II; interned at Jefferson–Hillman University Hospital in Birmingham; formerly resident in pediatrics at the Employees Hospital of the Tennessee Coal, Iron and Railroad Company in Fairfield; served as vice-president of the Madison County Medical Society; died in the Brookhaven National Laboratories in Upton, L. I., Oct. 5, aged 36, of brain tumor.

Council, Melton Downie, Vero Beach, Fla.; Johns Hopkins University School of Medicine, Baltimore, 1911; an associate member of the American Medical Association; veteran of World War I; died in the Veterans Administration Hospital, Richmond, Va., Oct. 5, aged 74.

Creighton, Matthew Eugene Ⓜ Chicago; Loyola University School of Medicine, Chicago, 1925; fellow of the International College of Surgeons; served on the faculty of his alma mater; member and past-president of the medical staff, St. Bernard Hospital; died Oct. 21, aged 59, of coronary occlusion.

Cronin, Herbert Joseph, Cambridge, Mass.; Harvard Medical School, Boston, 1911; member of the Massachusetts Medical Society; died in Boston Oct. 3, aged 69, of bronchopneumonia.

Daniel, Samuel Greene Ⓜ Marshall, Ark.; University of Louisville (Ky.) School of Medicine, 1895; died Oct. 1, aged 90.

Danskin, Melville George, Billings, Mont.; born in Colo, Iowa, Oct. 9, 1883; Northwestern University Medical School, Chicago, 1909; an associate member of the American Medical Association; a past-vice-president of the Montana Medical Association; for many years practiced in Glendive and eastern Montana; appointed county health officer for Dawson County in 1916, serving in this capacity for many years; from 1923 to 1927 mayor of Glendive and served as president of the state public health association and as the first president of the local Kiwanis Club; in 1916 named physician in charge of the Dawson County Hospital, holding that post for many years; died Oct. 11, aged 74.

Davis, James Matheson Ⓜ Wadesboro, N. C.; Columbia University College of Physicians and Surgeons, New York City, 1913; veteran of World War I; on the staff of the Anson County Hospital; died in Denton, Oct. 12, aged 69, of acute coronary occlusion.

Delbaum, Harry, Brooklyn; Long Island College Hospital, Brooklyn, 1935; member of the Medical Society of the State of New York; on the staff of the Unity Hospital; died Oct. 12, aged 49, of coronary disease.

Di Rienzo, George Michael Ⓜ Napa, Calif.; New York Medical College, Flower and Fifth Avenue Hospitals, New York City, 1948; member of the American Academy of General Practice; captain, U. S. Air Force from July 1, 1949, to Sept. 3, 1951; on the staff of the Queen of the Valley Hospital; died Oct. 14, aged 32, of coronary arteriosclerosis.

Dudley, Augustus William Ⓜ Cambridge, Mass.; Harvard Medical School, Boston, 1895; veteran of World War I; fellow of the American College of Surgeons; for many years on the staff of the Mount Auburn Hospital; died in the Westboro (Mass.) State Hospital Oct. 7, aged 90, of carcinoma of the colon.

Dunn, James Ⓜ Davenport, Iowa; Rush Medical College, Chicago, 1904; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; honorary life member and secretary of the Iowa and Illinois Central District Medical Society, and served as editor of its bulletin; at one time a medical officer in the U. S. Public Health Service; on the staffs of Mercy and St. Luke's hospitals; died in Muscatine Oct. 11, aged 79.

Dusthimer, Oren Isaiah Ⓜ Zanesville, Ohio; Ohio Medical University, Columbus, 1906; honored in June, 1956, when the Muskingum County Academy of Medicine presented him with a 50-year pin; received a certificate of distinction from the Ohio State Medical Association; on the staffs of the Good Samaritan Hospital and the Bethesda Hospital, where he died Oct. 13, aged 82, of rheumatic heart disease and pneumonia.

Ebeling, William Bruno, Brooklyn; Columbia University College of Physicians and Surgeons, New York City, 1914; specialist certified by the American Board of Ophthalmology; fellow of the American College of Surgeons; on the staff of the Brooklyn Eye and Ear Hospital; died in the General Hospital of Monroe County, East Stroudsburg, Sept. 13, aged 67, of mesenteric thrombosis.

Farrar, William Charles, Birmingham, Ala.; Birmingham Medical College, 1908; died Oct. 11, aged 79, of uremia and cardiovascular disease.

Field, Thomas Sullivan Ⓜ Green Cove Springs, Fla.; Dartmouth Medical School, Hanover, N. H., 1910; fellow of the American College of Surgeons; veteran of World War I; on the staffs of Duval County Medical Center, St. Luke's Hospital, and St. Vincent's Hospital in Jacksonville, where he died Oct. 10, aged 72, of bronchiectasis.

Fitzporter, Alonzo Leo Ⓜ Muskogee, Okla.; St. Louis University School of Medicine, 1910; service member of the American Medical Association; retired from the Veterans Administration regional office, in 1954; served most of his career in various veterans hospitals throughout the country; veteran of World Wars I and II; died in Tucson, Ariz., Oct. 13, aged 74, of coronary occlusion.

Frey, Robert David, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1890; died in the Allentown Hospital Oct. 10, aged 90, of uremia and generalized arteriosclerosis.

Friedman, Joseph Ⓜ Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1931; member of the American Academy of General Practice; veteran of World War II; died Oct. 4, aged 56.

Frymire, Ewett Waverly Ⓜ Frankfort, Ky.; University of Louisville Medical Department, 1905; died in the Norton Memorial Infirmary Oct. 9, aged 77, of arteriosclerotic heart disease.

Gallagher, James Francis Ⓜ Freeland, Pa.; Temple University School of Medicine, Philadelphia, 1925; on the staffs of the Hazleton State and St. Joseph's hospitals; member of the board of directors of the Hazleton Heart Association; died Oct. 7, aged 58, of coronary disease.

Gallivan, Thomas Humphrey Ⓜ Santa Ana, Calif.; Yale University School of Medicine, New Haven, Conn., 1909; specialist certified by the American Board of Otolaryngology; served on the staffs of St. Francis Hospital in Hartford, Conn., Community and Doctors hospitals in Santa Ana, and St. Joseph Hospital in Orange, where he died Oct. 14, aged 73.

Gibbons, Charles Kimball, Kearney, Neb.; Northwestern University Medical School, Chicago, 1902; past-president of the Buffalo County Medical Society; veteran of World War I; on the staff of the Good Samaritan Hospital; member of the Chamber of Commerce and the Rotary Club; died Oct. 3, aged 81, of gastrointestinal bleeding and shock.

Gleason, Ralph Sidney, Deer Island, Maine; Tufts College Medical School, Boston, 1929; interned at Eastern Maine General Hospital, Bangor; member of the Massachusetts Medical Society; for many years practiced in Wellesley Hills, Mass.; served on the staff of the Newton-Wellesley Hospital in Newton, Mass.; veteran of World War II; died Oct. 13, aged 53, of pulmonary hemorrhage.

Goudelock, John Jefferies, Monroe, N. C.; Medical College of South Carolina, Charleston, 1923; member of the Medical Society of the State of North Carolina; associated with the Ellen Fitzgerald Annex of the Union Memorial Hospital; was found dead in bed Oct. 13, aged 58, of a heart attack.

Grant, William Lee Ⓜ St. Paul, Minn.; Marquette University School of Medicine, Milwaukee, 1955; service member of the American Medical Association; interned at the Illinois Central Hospital in Chicago; served as a captain in the U. S. Army Reserve and as head of the outpatient clinic at Fort Leonard Wood, Mo.; died Oct. 18, aged 29, of coronary occlusion.

Gray, Robert Hollingsworth, Shreveport, La.; Bellevue Hospital Medical College, New York City, 1895; for many years on the staff of the Schumpert Sanitarium, where he died Oct. 5, aged 87, of injuries received when struck by an automobile on Sept. 27.

Hargrove, Henry C., Beckley, W. Va.; Howard University College of Medicine, Washington, D. C., 1908; died Oct. 1, aged 78.

Henry, John Robert, Winston-Salem, N. C.; Leonard Medical School, Raleigh, 1908; medical director of the Winston Mutual Life Insurance Company, a post he held for 39 years; medical director of Safe Bus Company; attending physician at the Kate Bitting Reynolds Memorial Hospital, where he died Oct. 3, aged 74, of gastrointestinal hemorrhage from esophageal varices, and cirrhosis of the liver.

Herbert, William, Dunedin, Fla.; Long Island College Hospital, Brooklyn, 1909; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons; formerly practiced in Brooklyn, where he was associated with the Brooklyn, Bushwick, and Brooklyn Eye and Ear hospitals; died in the Mease Hospital Sept. 26, aged 76, of arteriosclerotic heart disease.

MacBride-Dexter, Edith Ⓜ Sharon, Pa.; born in Grove City, Pa., May 3, 1887; Woman's Medical College of Pennsylvania, Philadelphia, 1910; from 1912 to 1917 physician for girls, Grove City (Pa.) College; appointed secretary of health, Commonwealth of Pennsylvania in 1935, serving until 1939; on Aug. 12, 1938, was awarded Pennsylvania's "meritorious service medal" by the governor, for distinguished service in public health during widespread floods of 1936, and for a progressive program as secretary of health; past-vice-president of the Medical Society of the State of Pennsylvania; for ten years secretary of the Mercer County Medical Society; served as chairman of the advisory board of health, as member of the sanitary water board, state board of medical education and licensure, state dental council and examining board, and state board of undertakers, Commonwealth of Pennsylvania; member of the Pennsylvania Public Health Association and served as chairman of executive committee; from 1935 to 1939 member of the Conference of State and Territorial Health Authorities; member of the Conference of State and Provincial Health Authorities of North America and the Pan American Association of Ophthalmology; at various times vice-chairman, secretary, and chairman of the Secretaries Conferences of Component County Medical Society of the State of Pennsylvania; from 1919 to 1935 on the staff of the C. H. Buhl Hospital, now known as the Sharon General Hospital, where she returned to the staff in 1939; ophthalmologist to the Sharon Plant, Westinghouse Electric Manufacturing Company and National Malleable and Steel Castings Company; died Oct. 11, aged 71, of a heart attack.

McKenna, Henry Joseph Ⓜ Louisville, Ky.; born in Louisville March 30, 1885; University of Louisville School of Medicine, 1910; associated with Mayo Clinic in Rochester, Minn., from July 1, 1912, to Feb. 1, 1915; veteran of World War I; formerly practiced in Kansas City, Mo., where he was president of the staff of St. Mary's Hospital; at one time president of the McKenna Distillery of Fairfield; fellow of the American College of Surgeons; member of the Industrial Medical Association; served on the staff of St. Joseph Hospital and as medical director of the Bendix Products Division of the Bendix Aviation Corporation in South Bend, Ind.; died in St. Joseph Infirmary Oct. 8, aged 73, of peritonitis and pneumonia.

Mateer, Harry Oliver Ⓜ Pittsburgh; Pulte Medical College, Homeopathic, Cincinnati, 1910; Hahnemann Medical College and Hospital of Philadelphia, 1912; for many years associated with the health service of the city schools; veteran of World War I; past-president of the Hahnemann Alumni Association; member of the staff of the Shadyside Hospital, where he died Oct. 1, aged 72.

Mendelsohn, Sidney Norman Ⓜ Cincinnati; University of Louisville (Ky.) School of Medicine, 1929; fellow of the American College of Surgeons; specialist certified by the American Board of Surgery; on the staffs of Our Lady of Mercy Hospital and the Jewish Hospital and Medical Center of Cincinnati, where he died Oct. 4, aged 53.

Meriwether, Ellyson Gwynne Ⓜ Memphis, Tenn.; Memphis Hospital Medical College, 1909; member of the American Psychiatric Association; died Oct. 7, aged 73, of cerebral thrombosis and arteriosclerosis.

Metheny, Samuel, Lincoln, Neb.; Lincoln Medical College of Cotner University, 1902; served on the faculty of his alma mater; died in the Bryan Memorial Hospital Oct. 2, aged 94, of intestinal obstruction and coronary thrombosis.

Noyes, John Russell Ⓜ Brockton, Mass.; Boston University School of Medicine, 1904; fellow of the American College of Surgeons; for many years associated with the Brockton Hospital, where he served as chief of the eye, ear, nose and throat service; consultant, Jordan Hospital, Plymouth; died Oct. 8, aged 82, of cerebral thrombosis.

Nussbaum, Oscar, New York City; Julius-Maximilians-Universität Medizinische Fakultät, Wurzburg, Bavaria, Germany, 1908; an *associate member of* the American Medical Association; died in the Jewish Memorial Hospital Oct. 11, aged 78, of intestinal neoplasm.

Rauch, Harvey Milton, Ormond Beach, Fla.; College of Physicians and Surgeons, Baltimore, 1904; member of the staff of St. Joseph's Hospital and the Falk Clinic in Pittsburgh, where he practiced for many years; died Oct. 1, aged 82, of a heart attack.

Reed, Russel Soule Ⓜ Seattle; Bennett Medical College, Chicago, 1913; died in the Virginia Mason Hospital Oct. 4, aged 70, of myocardial infarction.

Thorndike, W. T. Sherman, Philadelphia; born in Boston Jan. 16, 1893; Harvard Medical School, Boston, 1920; for many years on the faculty of his alma mater; an associate member of the American

Medical Association; member of the Massachusetts Medical Society; past-president and secretary of the Philadelphia Hospital Association and a member of its executive committee; member of the council on administrative practice, Hospital Association of Pennsylvania, advisory committee to the Commission on Blood Banks, Medical Society of the State of Pennsylvania, and on the advisory board of the Hospital Council of Philadelphia; during World War II served as registrar of the Sixth General Army Hospital in Casablanca and Rome; later served as commanding officer of the 154th Station Hospital in Italy and was discharged in 1946 with the rank of lieutenant colonel; interned at the Boston Lying-In Hospital and the Massachusetts General Hospital in Boston, where he was assistant director for many years; managing director of the Germantown Dispensary and Hospital, where he died Oct. 10, aged 65, of cancer of the prostate with metastasis.

Tillman, Isidor R., Brooklyn; University of Buffalo School of Medicine, 1901; an associate member of the American Medical Association; died Sept. 15, aged 87, of pneumonia, cardiac decompensation, cerebral thrombosis, and generalized arteriosclerosis.

Truex, Barbara Mae Binkley Ⓜ Jackson, Tenn.; Vanderbilt University School of Medicine, Nashville, 1942; served an internship at the Barnes Hospital in St. Louis and a residency at the Children's and Cincinnati General hospitals in Cincinnati, Ohio; on the staff of the Jackson–Madison County General Hospital; died Sept. 23, aged 40, of a basal skull fracture as the result of a fall from a horse.

Virden, Charles Edgar Ⓜ Kansas City, Mo.; born in Kansas City April 12, 1895; Northwestern University Medical School, Chicago, 1920; assistant clinical professor of radiology at the University of Kansas School of Medicine in Kansas City, Kans.; specialist certified by the American Board of Radiology, Inc.; past-president of the Jackson County Medical Society which in 1947 awarded him its certificate of merit; past-president of the Missouri division of the American Cancer Society and received a gold medal from the American Cancer Society for his work in connection with the disease; past-president of the American College of Radiology, Missouri State Medical Association, Kansas City Southwest Clinical Society, and the Radiological Society of North America; member of the Kansas City Academy of Medicine and the Industrial Medical Association; fellow of the American Geriatrics Society and the American Association for the Advancement of Science; consultant radiologist for the U. S. Public Health Service and the Parsons Tumor Clinic in Parsons, Kan.; instrumental in establishing the cancer clinic at the Kansas City General Hospital; chief radiologist at St. Joseph Hospital, where he served an internship and where he was associated for many years; died in the Georgetown University Hospital in Washington, D. C., Oct. 3, aged 63, of coronary thrombosis.

Whitely, Seals Leftwich Ⓜ Durant, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1949; member of the American Academy of General Practice; secretary-treasurer, Atoka, Bryan, Coal Counties Medical Society; served as county superintendent of public health; associated with Durant Hospital; died Sept. 26, aged 37, of teratoma of the mediastinum.

Willmarth, Edwin Hamilton Ⓜ New Castle, Pa.; University of Nebraska College of Medicine, Omaha, 1928; on the staffs of the Jameson Memorial Hospital and New Castle Hospital, where he died Sept. 19, aged 57, of cerebral hemorrhage.

Wilson, Eva McClenahan Ⓜ Mill Valley, Calif.; Northwestern University Woman's Medical School, Chicago, 1894; member of the Illinois State Medical Society; died Sept. 25, aged 88.

Wooden, James Leonidas Ⓜ Clatskanie, Ore.; University of Oregon Medical School, Portland, 1906; veteran of World War I; served several terms on the school board; the citizens of the Clatskanie area honored him with a "Doctor Wooden Day" in August of last year, commemorating 50 years of practice in the community; a fountain in the city park was erected and dedicated in his honor; for many years director of the First National Bank; died in the Emanuel Hospital, Portland, Oct. 7, aged 76, of cancer of the cecum and chest with metastasis and bronchopneumonia.

Zimmerman, Frank Dieffenbach, Schaefferstown, Pa.; Jefferson Medical College of Philadelphia, 1907; an associate member of the American Medical Association; past-president of the Lebanon County Medical Society; president of the Heidelberg Water Company; for many years served as president of the Schaefferstown National Bank, prior to its becoming a branch of the Lebanon Valley National Bank, of which he was director; a charter member of the local Lions Club; on the staff of the Good Samaritan Hospital in Lebanon; died Sept. 27, aged 80, of acute coronary occlusion.

FOREIGN LETTERS

BELGIUM

Lung Cancer.—Prof. J. Firket (*Proceedings of the Royal Society of Medicine of London*) studied air pollution in Liege, an industrial center. He found that the homes of 500 patients with pulmonary cancer were largely concentrated in the center of the city. Many workers were employed in the huge metallurgic establishments just upstream of the city and lived in houses built 10 to 15 years ago. Because of the prevailing wind, the area they all occupied was one of the least polluted by chemical dust, yet the number of workers with pulmonary cancers was fairly large. In contrast, in the center of the area which is surrounded by a horseshoe bend of the Meuse River, immediately northeast of the first area, there were few patients with cancer even though this is a sort of tableland on which dust settles in abundance. There was no industry on the plateau and it has been a pleasant residential area for about 45 years with many trees and occupied by the upper middle class. The extensive dust pollution of this area was not known at the time it was built.

The author was struck by the large number of persons with cancer living in the center of the city and especially in streets beside railways or canals. The attention was drawn to these by their names, "Rue de la gare, Rue de la station, Rue du chemin de fer, and Rue du vicinal." Railway engines were an obvious source of air pollution and steamboats also definitely polluted the air around the docks. In 1955 the incidence of lung cancer in Canada was found to be five times higher among locomotive engineers than among the whole population. Engineers inhaled carcinogenic hydrocarbons either from the sooty exhaust of diesel engines or the smoke of coal-burning locomotives.

In Belgium, too, one can see a striking correspondence between smoke and lung cancer. In the vicinity of factories in Herstal, one can find many men out of work because of cancer, but as the valley runs north the incidence suddenly drops and, at the same time, the smoke disappears. Toward the east the smoke continues and with it the cancer. From five years of research it must be concluded that lung cancer has a complex etiology. Of several factors cigarette smoking is an important, but not an essential, one. Polluted air, and particularly the hydrocarbons contained in soot, appear to be even more important.

BRAZIL

Tetanus Neonatorum.—Dr. Francisco La Scala (*Jornal de pediatria*, vol. 23, September, 1958) reported a series of 56 patients with tetanus neonatorum. He called attention to the low incidence of this disease among Negroes, indicating a racial resistance. Only six of these children recovered despite the use of antitetanic serum and antibiotics. The author advocated as a preventive measure against this complication the immunization of expectant mothers who cannot have the assistance of an aseptic delivery.

Schistosomiasis.—Dr. Luis Rey (*Hospital*, vol. 54, October, 1958) reported that a new focus of schistosomiasis has been discovered within the city of São Paulo. He believed that new foci appear only as a consequence of favorable conditions recently created. Due to the inefficiency of molluscocides and the limitations of chemotherapy, greater emphasis must be placed on sanitary methods of control aimed not against schistosomiasis alone but against all endemic diseases spread through feces and polluted water.

Prevention of Abortion.—Cerruti and Fernandes (*Revista d'obstetricia e ginecologia*, vol. 103, July, 1958) have simplified the technique of interpreting the vaginal smears considering only the eosinophilic index and the progestational modifications. They studied a series of 239 women in the first trimester of pregnancy with threatened abortion, taking one, two, or three smears from each. In 118 patients with a "good prognosis" they had 11% of error with one smear and 6.8% and 5.1% with two and three smears respectively. In 121 patients with a "bad prognosis" the error was 6.6% with one smear and 4.2% with two or three smears. The authors reached the following conclusions. The vaginal smear was of no value as a diagnostic test of pregnancy. In patients with a bad prognosis showing cells indicative of fetal death, this conclusion was invariably correct. The lessening of absence of progestational modifications had a greater prognostic value than the rise of the eosinophilic index. Vaginal smears did not permit differentiation between the phase of ovum death and that of its expulsion. Intensive estrogenic treatment did not alter the appearance of the vaginal smear in pregnancy. An unfavorable vaginal smear found in patients without any clinical signs of abortion had no prognostic value because in such patients pregnancy often proceeded normally.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Statistical study of this material indicated that the progestational modifications had greater value than the eosinophilic index and the examination of a second smear lessened the chances of error and established that within a reasonable range of error it is possible to give a prognosis regarding a threatened abortion. Incipient miscarriage would appear to be due primarily to fetal rather than maternal factors. From a purely clinical point of view it is possible to establish the prognosis of an abortion only when the symptoms and signs become evident. It is then often too late to apply effective preventive measures. The authors found that the pregnandiol level had scant value for the prognosis of threatened abortion because (1) of the relatively low amount of this hormone at the beginning of pregnancy, with little difference between its level at that time and during the secretory phase of menstruation; (2) frequent discrepancy between the expected pregnandiol level and the course of pregnancy; and (3) the great technical difficulty of determining the level. The frog test is easier to make. The repetition of this test is of value for the prognosis of threatened abortion. The vaginal smear is an easy process which can be repeated as required if abortion threatens. Vaginal cytology does not indicate the amount of hormones in the blood but gives a sufficiently accurate idea of the balance between estrogen and progesterone, thus giving advance warning of a hormonal imbalance in patients with threatened abortion.

Polyposis of the Colon.—Dr. Silvio Levy, (*Arquivos de cirurgia clínica e experimental*, vol. 21, 1958) in a series of 67 patients with polyposis of the colon, found carcinoma in 18. One of the most important aspects of this series was the presence of malignant polyps in the first decade of life (25% of the cases). The incidence of polyps in about 6,000 patients was 1.5%. In the diagnosis of the polyp it is important to recognize the lesion, even in asymptomatic patients. X-ray examinations are indispensable for the detection of polyps above the reach of the sigmoidoscope. This higher localization of polyps occurs more frequently than was recognized before the use of the barium enema. The biopsy may be total or partial. The total biopsy represents a complete therapeutic procedure in itself in patients with noninvasive carcinoma. Partial biopsy should never be done if the lesion is small, but it is advisable for polyps measuring more than 1 cm. in diameter, especially if they are sessile or if they present macroscopic signs of malignancy. The operative indications and the choice of the surgical procedure should be based on (1) localization of the polyp, (2) macroscopic appearance of the polyp, (3) microscopic appearance of the previous biopsy specimen, (4) number of polyps and presence of other lesions, (5) age of the patient, and (6) medicosocial factors such as facilities for an efficient follow-up.

The simple excision of the adenoma through an endoscope is indicated for small polyps if the histological appearance does not suggest the presence of malignancy, or for a polyp with a previous biopsy specimen indicating noninvasive carcinoma, grade 1, or carcinoma "in situ." Radical surgical resection is advisable for an invasive carcinoma diagnosed by a previous biopsy or diagnosed after the excision of the lesions, or if the patient cannot be rigorously followed up. For villous adenomas, resection is also preferable. Polyps of the various segments of the colon, which cannot be treated endoscopically, must be explored by laparotomy. It i advantageous always to perform a complete proctoscopy to decide the extent of the resection. If ther is suspicion of the presence of metastases, the examination of fragments of regional lymph nodes i of value. Resection is preferable to the simple excision of the polyps and is a much more complete operation. For sessile adenomas a primary segmental resection is imperative. Villous adenomas should be resected with the segment.

INDIA

Plasma Amino Acids in Malignancy.—G. Y. N. Iyer (*Indian Journal of Medical Research*, vol. 46, July, 1958) studied 42 patients with malignancy to determine the levels of free alanine, glutamine, glutamic acid, glycine, serine, tyrosine, valine, leucine, and isoleucine in the plasma; 18 of the patients were suffering from leukemia, 6 had carcinoma of the stomach, 6 had carcinoma of cheek, 4 had cancer of the uterus, 3 had Hodgkin's disease, 2 had cancer of the palate, 2 had cancer of the penis, and 1 had carcinoma of the prostate. Paper chromatography was used for estimation of the amino acids in the plasma. A rise in the glutamic acid level was seen in all patients. The levels of all the other amino acids except glycine showed a fall, and the level of glycine was not significantly changed except that it was raised in all patients with leukemia. No correlation was observed between the type and location of malignancy and the changes in plasma amino acids.

Plasma Insulin Estimation.—Aiman and Kulkarni (*Indian Journal of Physiology and Pharmacology*, vol. 2, July, 1958) stated that because certain diabetics prove resistant to insulin, insulin deficiency may not be the only cause of diabetes. They estimated the plasma insulin level in 5 nondiabetic and 10 diabetic persons by the rat diaphragm method. Insulin therapy was discontinued for 48 hours and carbutamide therapy for 15 days before the assay of plasma insulin. The postprandial blood sugar level was estimated in each case to exclude any latent derangement of carbohydrate metabolism.

The plasma insulin levels in the nondiabetics ranged from 0.7 to 6.3 milliunits per milliliter. In two diabetics who were middle-aged, whose disease had been discovered within a period of less than six months and who did not require insulin, the plasma insulin levels were within the normal range. Four middle-aged diabetics required insulin and responded well to carbutamide or tolbutamide and showed plasma insulin levels that were lower than normal, but these readings were a little higher than those obtained in two other middle-aged diabetics, one of whom did not respond to carbutamide. The remaining two diabetics who were in a younger age group also showed low plasma insulin levels and an evidence of the presence of an excess of anti-insulin factors in their plasma. Thus juvenile diabetes is probably due to an excess of anti-insulin factors circulating in the plasma, while the diabetes of middle age is more probably due to a deficiency of insulin in the plasma. This method can also be used in selecting patients for carbutamide therapy. In the present series, patients with a moderate concentration of insulin in the plasma showed a good response to this therapy, while those with a negligible insulin content failed to respond.

Cesarean Section.—S. Apteka analyzed a series of 1,344 cesarean sections performed at the Cama and Albless Hospitals, Bombay, from 1930 to 1956 (*Journal of the Association of Medical Women in India*, vol. 46, May, 1958). This series represented 1.4% of all deliveries at these hospitals. All cases of ruptured uterus were excluded from these statistics. The incidence was highest in 1940 and 1942 and lowest in 1951, 1952, and 1953. Contracted pelvis accounted for 73.6% of cesarean sections at these hospitals. Most of the patients who come to these hospitals are poor and undernourished and therefore likely to be underdeveloped and to suffer from rickets and osteomalacia. The incidence of repeated cesarean sections was very low—0.6%. This operation was repeated only in patients in whom it was suspected that the scar of the previous operation might give way. All patients who had a cesarean section at one delivery for an indication which was not present at a subsequent pregnancy were allowed to deliver per vaginum under careful observation. The maternal complications for which cesarean section was performed were eclampsia, essential hypertension, intracranial tumor, infective jaundice, and obstructive cholecystitis. The number of cesarean sections performed for osteomalacic pelvis decreased from 53.5% in the years 1930-1934 to 19.6% in the years 1950-1956. This might be due to improved general living conditions.

Other varieties of contracted pelvis did not show any appreciable difference in their incidence. Placenta previa as an indication for cesarean section was seen to be increasing. During the period 1930-1934, of a total of 170 sections, only 1 was performed for this condition, while during the period 1950-1956, 51 of a total of 418 sections were performed for placenta previa. The classic type of operation was performed on 513 patients (38.2%), lower segment operation on 824 (61.2%), cesarean hysterectomy on 6 (0.5%), and extraperitoneal cesarean section on 1 (0.1%). The number of classic cesarean sections showed a definite decrease in the more recent period. In the period 1930-1934, it was performed on 78.2% of the patients and in 1950-1956, on 15.3%. The number of lower segment sections increased from 21.2% in 1930-1934 to 84% in 1950-1956. The low classic incision was still preferred for some patients, e. g., when dense adhesions with the urinary bladder were present as a result of a previous cesarean section or in some patients with transverse or oblique position of the fetus. The cesarean hysterectomies were all performed for uncontrollable hemorrhage after extraction of the baby, except in one patient who had a carcinoma of the cervix.

The average maternal death rate was 3.9%. Although the maternal death rate has fallen in recent years as a result of the use of antibiotics and blood transfusion, there was not a single death after cesarean section in the earlier period. The cause of death was puerperal infection in 16 patients, and most of these were treated in the period 1930-1934. Shock (operative or due to hemorrhage) accounted for 16 other deaths, and in one patient on whom extraperitoneal cesarean section was attempted spinal shock developed soon after commencement of the operation and the patient died. In two cases death was attributed to the general anesthesia and in three to pulmonary embolism. One patient died of paralytic ileus, and in 13 others the cause of death was a complication of pregnancy. There were 165 fetal deaths in this period, an incidence of 12.3%, and in the period 1952-1956 it was 17.6%. This high fetal death rate was associated with antepartum hemorrhage. Of the 12 stillbirths in this period, 3 were associated with abruptio placenta and 6 with placenta previa. There were 43 neonatal deaths, of which placenta previa associated with pre-maturity accounted for 10. From 1952 to 1956, of a total of 55 deaths, asphyxia was the cause of 21, and 11 of these showed evidence of fetal distress before the section was performed. All of these mothers had had a trial labor. All the babies were asphyxiated at birth and died within the first 48 hours. Eight mothers did not have a trial labor. Their babies were asphyxiated at birth and died within 48 hours, except one who died of bronchopneumonia on the fifth day. In these cases, probably the general anesthesia was responsible for the asphyxia.

JAPAN

Tuberculosis.—Because tuberculosis affects so many young persons, it is one of the nation's most pressing health problems. A government report places the number of cases of active tuberculosis at 3,400,000 and of arrested disease needing close observation at 1,470,000. Patients who know they have the disease but refuse to be treated constitute a dangerous source of infection. Among those with active tuberculosis about 410,000 have open cavities and about 860,000 require sanatorium treatment. Some improvement in the situation in general has occurred in the past five years.

Use of Hospital Beds.—Dr. Hideguki Iwasaki reported that, although the general hospitals and especially the psychiatric hospitals are overcrowded, there is a growing surplus of beds in the tuberculosis sanatoriums. This is partly because with modern improvements in the treatment of tuberculosis the patients can be discharged much sooner than was formerly the case and partly because many patients with tuberculosis cannot afford sanatorium care. At present no provision is made to assist such patients with public funds. Since the general hospitals are best adapted to care for patients with acute diseases and ill adapted for the care of those with chronic illnesses, unoccupied beds in tuberculosis sanatoriums are being used for such patients.

PORTUGAL

Hormonotherapy for Tuberculosis.—Cordeiro Ferreira and co-workers (*Rev. portug. ped.* 21:281-290, 1958) treated a large series of tuberculous patients with prednisone, in a daily dosage of 1 mg. per kilogram of body weight. All patients always received isoniazid and streptomycin as well. Definite improvement was obtained with steroid therapy in patients with tuberculous meningitis, miliary tuberculosis, and pleurisy. Local application of steroids in patients with tuberculous adenitis of the cervical lymph nodes also produced greater improvement than treatment without steroids.

Adrenals and Mammary Cancer.—Frazão and Botelho (*Rev. iber. endocrinol.* 28:433-441, 1958) studied the changes in the adrenals removed from patients with advanced and generalized mammary cancer. The changes in the adrenal cortex and medulla were identical with those seen in the adrenals of animals subjected to stress. In the cortex, the zonal disorganization, spongy appearance, folicular formations, and increase in lipoid and cholesterol content were similar to those associated with hypertensive disease and other conditions of stress. Vacuolar degeneration of the medulla also corresponded to findings seen in animals subjected t stress.

UNITED KINGDOM

Influenza Vaccine.—British experts have produce a live virus vaccine against influenza, which is being tested on volunteers. If it proves effective an safe, it will provide a new protection for the population at large. An attenuated live virus has th advantages over a killed virus that it can be produced much more quickly and is easier to give. A smaller dose suffices. The killed vaccine is injected. The live vaccine can be sprayed into the nose and throat. Because it is more virulent, it should not be given to young children. Work on the new vaccine is proceeding at the National Institute for Medical Research. Promising results with a live virus were achieved by the Russians. The cost of protection is likely to be less than with the vaccines used hitherto, and it offers the least discomfort. Ample supplies of killed virus vaccine, which has been proved to give 60 to 70% protection, are available. Vaccination is especially important for expectant mothers and people suffering from cardiovascular, pulmonary, or metabolic diseases. All such people can be vaccinated under the National Health Service.

Colored Immigrants.—According to an annotation in the *British Medical Journal* of Oct. 4, about 190,000 colored people live in Great Britain. This is about one colored to 250 white, though the distribution of the colored people is notably uneven owing to the greater prospects of employment in the industrial cities. Of these 190,000, about 100,000 came from the West Indies (chiefly Jamaica) and 50,000 from India and Pakistan. Because members of the British Commonwealth are free to come here, no administrative machinery exists to keep a count of their exact numbers. There is no doubt that the current high estimate is a phenomenon of the last decade. Unrestricted immigration from any country, whatever the color of its inhabitants' skins, is likely to cause difficulties when the country they enter is already densely populated. The social evils of slum life are apt to spread and defy attempts at their eradication. Fraud and frustration appear, and the immigrants, uprooted from gay and friendly company, seek ephemeral friendship and sexual solace where they can find it. An additional problem, apparently specific to the migrants from Jamaica, is that in the West Indies marriage has largely given way, through a transitional stage of "faithful concubinage," to outright promiscuity. It is thus not surprising that many half-caste children and some full West Indian babies are found in our orphanages. Indeed a quota of 4 colored children in 10 has already been filled in these orphanages in some parts of the country.

While the social prospects of these population movements are not notably favorable, the strictly biological prospects are obscure. There is a lack of precise knowledge about the long-term implications of the human genetic mixtures taking place in our times, partly because of the relatively slow rate of breeding in the human race and partly because experimental breeding is out of the question. Moreover, it is debatable what, if any, inferences about miscegenation in human populations can be drawn from animal experiments, and in particular whether heterosis, or hybrid vigor, can be detected. All would agree with the society's advocacy of more research into the results of race-mixing, for ease of travel is likely to increase rather than impede it. Nor can anyone doubt the need for more education of people in an appreciation of the qualities distinctive of unlike or alien nations. While the question of whether immigration to Great Britain from Commonwealth countries should be restricted has many features outside the immediate professional interests of physicians, it is one on which they are well equipped to provide evidence, and to judge dispassionately.

Health Insurance.—The Fellowship for Freedom in Medicine has persuaded the British United Provident Association (B. U. P. A.) to launch an insurance scheme to help cover the cost of private treatment by general practitioners. The scheme will become effective in January. While there are already several excellent schemes insuring against the costs of treatment in a hospital as a private patient, private clinic, or nursing home, and of specialist advice or investigation, this is the first insurance scheme to cover the cost of private treatment by a general practitioner. It will be restricted to those already insured under B. U. P. A.'s standard scheme (for such items as private beds and specialist fees) whereby for an additional rate a subscriber may obtain insurance for himself and his dependents for attendance by a private general practitioner and for minor operations. The cost of drugs is not included.

Healing by Clergymen.—The report of the Archbishop's Commission on the Church's Ministry of Healing stated that all healing was divine healing and that healing concerned the whole person as an interrelated amalgam of spirit, mind, and body. One does not treat sickness, one treats a sick person. Many diseases are spiritual in origin and according to the report at least 33% of the patients in hospitals need the ministry of a priest rather than a physician. The Bishop of Coventry, however, stated that healing did not always follow faith, nor was suffering always contrary to God's will. Many public healing services have fostered a false impression that God must heal. It is wrong to assume that death is necessarily a disaster. There is a danger in calling this ministry "faith healing" or even "divine healing." Physicians are just as much the ambassadors of God in His ministry of healing as are pastors and praying laymen. It is right to remind the clergy that they have a ministry of healing, but there is a danger that people may become preoccupied with what they call the ministry of healing to the total exclusion of every other kind of ministry. They must see it in its proper perspective in relation to the total aspect of their ministry.

The Bishop of Lichfield said that the medical profession was ready and anxious to receive a lead from the Church. Later a succession of speakers affirmed their belief in demons. Canon E. G. Burrough of Oxford University said that he was a profound believer in angels, and also in demons. He believed that many of the people who spent their lives in lunatic asylums were possessed with evil spirits rather than suffering from diseases of the brain. The Dean of Windsor said there was nothing in the creeds about belief in angels or demons. He pled for "a reverent agnosticism" on the subject.

Oral Penicillin.—In the *British Medical Journal* of Oct. 11, David Wheatley sent a questionnaire to 180 members of the Northern Home Counties Faculty of the College of General Practitioners regarding penicillin for oral use. Although such preparations have been in use for nine years, the value of this method of administration is still subject to controversy. Wheatley received replies from 85 members. Of these 78 gave penicillin by mouth, 70 used it for both children and adults, and the rest for children alone. The ratio of patients treated orally to those treated by injection over a 20-day period in May was 5:2. These results, coming from varied practices, were probably representative of national custom. This being so, more penicillin may now be given by mouth than by injection. Of the infections commonly treated orally with penicillin, tonsillitis and acute otitis media ranked high followed by acute bronchitis, pneumonia, and boils. These results reflected the common penicillin-sensitive infections met with in general practice, with the exception of severe deep-seated infections, such as carbuncles, which are probably best treated with injections of penicillin.

With regard to the preparations used, penicillin V appeared to be sweeping the field although benzathine penicillin in its liquid form still retained a place in the treatment of children. Combined penicillin and sulfonamide therapy was not particularly popular, only 18 of the 85 using it. Its indications were for such infections as pneumonia or others that failed to respond to penicillin alone. The dosage schedules used showed wide variations; 56 of the doctors gave 60 mg. of penicillin V every three to six hours for children up to 5 years of age and

52 gave double this dose to adults. The dose used for other preparations was two or three times the above for adults. This would seem to reflect fairly accurately the difference between the amount of penicillin V absorbed from the gastrointestinal tract and that of other penicillin salts. A four to five days' treatment for the infections listed was recommended by 66. One physician thought that oral administration was better than injection; 64 found the two forms comparable. Of those who thought oral administration not as good as injection, 2 probably used inadequate doses. More continued to give the drug by mouth rather than by injection despite their impressions of the relative efficiency of the two methods, probably because they found the oral preparation effective enough to allow its advantages to overcome any slightly diminished therapeutic effect. Most general practitioners appeared to be satisfied with the effectiveness of oral penicillin therapy.

Doctors' Plea Fails.—Mr. Maclay, secretary for Scotland, told the British Medical Association (B. M. A.) that he cannot join with them in presenting a special case to the Court of Session on the general practitioners' pay dispute. He had been asked to agree to the presentation of a case to test the validity of the Spens Report and the Danckwerts adjudication on doctors' remuneration. The B. M. A. had taken counsel's opinion and was advised that in Scotland there existed a "special case" procedure for which the consent of Mr. Maclay was necessary. In a letter to the Association Mr. Maclay stated that he made his decision because he believed with the Minister of Health that no contractual obligation existed between the government and the medical profession on remuneration, and because a Royal commission was considering the matter. A spokesman of the B. M. A. said that the rejection of the Association's offer had been made without Mr. Maclay asking to see the Association's draft of the stated case. Mr. Maclay had been less than candid in his reference to the letter of rejection of November, 1956. The letter said that if the B. M. A. was not prepared to accept the Minister's rejection, the matter could be brought before the courts for adjudication. The spokesman added that despite the fact that the suggestion of obtaining a legal decision on the disputed question came originally from the government, the Secretary of State had rejected this approach. It may be that the government is less confident about the probable result of the suggested legal proceedings.

Medical Maneuvers.—Striking advances in the technique of rescuing and treating men wounded in action have been demonstrated by the Royal Army Medical Corps. After a mock nuclear explosion, "seriously wounded" infantrymen were evacuated from the front line by relays of helicopters. Spectators watched the progress of an infantry battalion advancing to forward positions. While still short of their objective the nuclear missile burst on their flank less than a mile away. A smoke mushroom streaked with orange rose 300 ft. over the Surrey pine woods. When it dispersed the battlefield was strewn with "casualties." Survivors among the five highly qualified medical soldiers, who now form part of every infantry battalion, sprang quickly into action giving prompt medical treatment to the wounded. Within ten minutes two of the most severely wounded were being evacuated in a new midget helicopter. Soon larger Whirlwinds from the joint experimental helicopter unit at Middle Wallop brought doctors, medical equipment, and supplies, and evacuated the wounded at the rate of one every three minutes. As a finale the helicopters landed a field surgical team.

Helicopters are still inadequate for large-scale operations of this nature, but a type which Army Medical Services officers said they would like to use for casualty evacuation, the new 48-seat Fairey Rotodyne, made a demonstration run after the exercise. An unusual feature of the exercise was the appearance of 48 women, who made up the first and only field medical company staffed entirely by women. The unit was formed to prove that even if all male physicians and orderlies from a casualty clearing station had to go forward in an emergency, women could carry on.

Blood Groups in Cyprus.—While establishing a blood bank in Cyprus, Clearkin made blood tests on 10,000 of the population of the island (*Brit. M. J.* 2:939, 1958). He examined the distribution of ABO and Rh (D) blood groups among both the Greek-speaking and Turkish-speaking inhabitants of the island. Basing his conclusions on fully adequate population samples, he found little difference between the ABO and Rh (D) blood group distributions in the two groups, but in their ABO frequencies both groups differed from the Greeks on the European mainland, and resembled more closely the Turks and inhabitants of the Levant. Populations which within the last few thousand years have shared a common ancestry have similar blood group frequencies. Hence a difference in blood group frequencies is evidence that ancestries differ. It is thus surprising to learn that the Greek-speaking Cypriots do not appear to have Greek ancestry at all, and are in fact genetically more closely related to the Turkish Cypriots than to the Greeks. Whether these observations on blood groups will help solve the racial problem in Cyprus is another matter.

Work Study in Hospitals.—Work study and scientific methods of working are to be tried in the physiotherapy departments of 3,000 hospitals in the

National Health Service. Because these are among the busiest departments in most hospitals, and are so short staffed, it is hoped that work studies may increase efficiency. More than 100 heads of physiotherapy departments have just attended a conference at Westminster Hospital, London, to deal with the problem. Work study methods are already in use in many departments at this hospital.

Addiction to Freely Obtainable Drugs.—All drugs which it is thought can cause, or are likely to cause, addiction are obtainable only on a doctor's prescription. According to the World Health Organization committee on drug addiction, such addiction is a state of periodic or chronic intoxication, detrimental to the individual and to society, produced by the repeated use of a drug. The characteristics of addiction are an overpowering desire to take the drug and eagerness to obtain it by any means, a tendency to increase the dose, and a psychological and sometimes physical dependence on it. The sale of new drugs may escape being restricted, as they may be in use for some time before their addictive properties are discovered. Drugs that have either a euphoriant or sedative action are likely to cause addiction in predisposed persons. Three drugs obtainable in Britain without prescription have recently been reported to have addictive properties. They are carbromal, tincture of chloroform and morphine (Chlorodyne), and phenmetrazine. Carbromal, a mild hypnotic and sedative, is sold by pharmacists under a number of proprietary names or as a constituent of proprietary mixtures. Some patients who are advised to take one or two tablets containing carbromal daily eventually take 15 to 20. Addicts taking it may become stuporous and ataxic. Chlorodyne, which contains 1 mg. of morphine in a two-teaspoon dose, has long been used as a domestic remedy. Its use in Britain is unrestricted. A case has been reported in which the patient consumed 160 ml., or one-third of an ounce, of this tincture daily. This amount contains 16 mg. of morphine. Phenmetrazine is a weight-reducing drug that is being used by addicts in place of amphetamine, a restricted drug, although its euphoriant properties are not so great. It is suggested that all new drugs should be initially listed under the poisons rules until they are shown to be innocuous, at which time they may be released and obtained without prescription.

Anastomosis in the Coronary Circulation.—It is generally believed that in the coronary circulation anastomoses follow the occurrence of ischemic myocardial episodes, appearing where and when needed. This view is questioned by Laurie and Woods, who investigated the blood supply in both normal and diseased hearts of 150 Bantu patients (*Lancet* 2:812, 1958). Working in a native reservation they were able to perform autopsies on 67% of the patients dying in hospital. Hearts were perfused after death with lead phosphate suspended in gelatin, and roentgenograms were taken of the coronary circulation. The coronary artery and its major vessels were examined microscopically. Of 200 such perfusions, only 150 were technically successful. Functionally significant anastomoses were found in 75% of normal hearts from patients over 4 years of age, but in only 23% of hearts from patients with chronic ischemic heart disease. Functionally significant anastomoses were found even in the hearts of some newborn infants with no cardiac disorder. One child 13 days of age had a complete anastomosis to the left circumflex artery and to the whole right side of the heart, shown by perfusion into the left descending coronary artery. The authors considered that if anastomoses form after an ischemic heart attack, as has been suggested, there would be insufficient time for these to develop, as the myocardium cannot survive more than 20 minutes if deprived of its blood supply. They believed that the most likely explanation is that most healthy persons have a functionally important coronary anastomotic blood supply at birth. This anastomosis probably protects some against ischemic heart disease and may modify this condition in others.

Reduction of Sputum Viscosity.—In chronic bronchitis the mucosa of the bronchial tree is abnormal and the mucus-secreting glands, which are overdeveloped, produce excessive amounts of an abnormally tenacious mucus. This is a good medium for bacterial growth and leads to superadded infection and purulent sputum. The viscosity of the sputum of the chronic bronchitic is proportional to its hydration and mucoprotein content. The latter consists largely of desoxyribonucleoprotein (DNP) fibers. Robinson and co-workers (*Brit. M. J.* 2:119, 1958) showed that the viscosity of bronchitic sputum can be reduced, and the clinical condition of the patient improved, by the insufflation into the peribronchial tree of a dry powder containing desoxyribonuclease and chymotrypsin. The size of the particles is important because if they are too large they will not reach the peripheral bronchial tree and may be deposited in the pharynx and trachea. The ideal particle size is around 3μ. With use of fluorescent-labeled chymotrypsin it was shown by means of bronchoscopy that some of the particles reached the terminal bronchioles. Tests were made with the powder on 36 chronic bronchitics. The sputum was collected daily, measured, and examined for mucoprotein and DNP fibrils, color, consistency, and relative viscosity. In 86% of the patients the sputum showed decreased viscosity, and in 66% there was appreciable lysis of the DNP fibrils. In 67% there was subjective improvement, which was pronounced in several. Sputum was expectorated more readily and physical signs, particularly dyspnea, improved in nearly 50%. The possibility of sensitization to the enzymes exists but appears to be remote.

Health Hazard from High-Power Radio Stations.—*The Times* reported that the operation of certain forward-scatter radio links to be set up in Britain under NATO arrangements may constitute a hazard to the health of the local community. Each of these high-power, two-way directional radio stations would have a sterilized zone in its beam extending a mile or so ahead of the station in the direction of the transmission. The public will not be allowed permanently in these zones, and any existing farms or homes in the immediate vicinity of the new radio stations would have to be evacuated. It is even suggested that "death rays" might be emitted in these new radio stations. The Ministry of Defense, on the other hand, minimized the danger and stated that there might be a slight radiation hazard from the introduction of new radio techniques and advised the fencing off of an area of about 40 yd. in depth in front of the transmitter cones. The matter is being taken up by the Medical Research Council, whose experts pointed out that the hazards are not as great as those of nuclear radiation. The energy emitted does not produce the same biological changes and as far as is known does not have any genetic effects on future generations. The Council stated that those who have been working with radar for nearly 20 years have not suffered from any ill-effects and that animal experiments show that this form of radiation must be of high potential to constitute a hazard to health.

Cytological Screening for Cancer of the Cervix.—A report from the Faculty of the College of General Practitioners of S. E. Scotland shows that the cytological detection of early cervical carcinoma can be readily undertaken in general practice, and that it is well worth while in view of the number of unsuspected cases of cancer brought to light. Twenty general practitioners took cervical smears from all women coming for postnatal examination, from postmenopausal women without a history of disease of the genital organs, and from as many women as possible in whom a complete medical examination was indicated. Cervical smears were taken from 1,000 women and the slides sent to Edinburgh University for pathological examination. There were 15 unsuspected positives; that is, those who had a healthy cervix on inspection and palpation, but whose cervical smear was either suspected of cancer or frankly malignant. Five atypical cases were also found. The average age of this group was 35½ years. These patients were immediately referred to a gynecologist for further treatment. Six underwent total hysterectomy, one was treated with radium, and the rest were still under observation, four of them having had the cervix amputated. This incidence of 1.5% unsuspected cases of cancer of the cervix detected in general practice was high. Figures from hospital surveys made in gynecologic departments were about half this. The general practitioners concerned were unanimous in their opinion of the value of the cervical smear as a routine screening test and considered that it should be part of every pelvic examination.

Cutting Health Service Costs.—Proposals for improving the National Health Service without increasing the cost were made in the first of a series of debates at the Local Government Conference in response to a paper by Sir Keith Joseph, M. P. Sir Keith referred to defects in the service and recommended that before going to the taxpayer for extra revenue, efforts be made to improve efficiency by modern management techniques. Specifying the drug bill in particular, he said that 10% of the total cost went for drugs and that a method should be found to make the public pay more of this cost. A false incentive was given by the relatively low charge of 14¢ for prescriptions when the prescribing cost alone was nearly 28¢. The charge must, however, be so arranged that it does not discourage recourse to the physician when necessary. The grievances of patients who wait hours at clinics to see a consultant for a few minutes were aired by Mr. P. Maybury, of Swansea, who said the consultants are not to blame as many are overworked. The system falls down for lack of coordination. Dr. Dulcie Staveley, herself a consultant who kept patients waiting, blamed the general public's lack of a sense of time, saying, "You can give them appointments and work out the average amount of time it takes to see them but you can't work out whether the average person will keep the appointment." Mr. W. Lindsay, vice-chairman of the East Sussex County Council, complained that benefits are given to people who do not need them. The patient should at least pay for his board and lodging in the hospital if he can afford to do so.

Mr. Walker-Smith, Minister of Health, described the service as generally efficient although methods of promoting efficiency are always being considered. When the Labor Government was in office not one hospital was in progress or planned. Today 10 are in progress and 11 planned; 31 major schemes of hospital extension and modernization are in progress, and 60 are planned. Regarding patients' waiting time the Minister said that a hospital could never be equated with a factory or the healing of the sick with the making of goods, but new techniques would be introduced where it was possible without detriment to the care and treatment of the sick. Five times as much is spent on drugs to keep patients out of hospitals as on drugs in hospitals. This gives a double benefit. This does not mean that costs should not be curtailed as far as possible without detriment to the patient. The speed and stress of modern life has increased the ratio of mental to physical illness. More than 40% of the hospital beds are devoted to mental cases. This is a great problem and challenge. More of these patients should be treated in the community rather than the hospital. Old people must be helped not only to live longer but to remain fit and active. Greater emphasis must also be placed on the prevention of illness.

At a Conservative Party conference Mr. Thompson, Parliamentary Secretary, Ministry of Health, stated that the big economies people want in the Health Service can be made only by closing hospital beds, charging for doctors' visits, or scrapping important parts of the service. Those who urge a better service at lower cost should not ask for the impossible. He was replying to a motion which urged that, in view of the ever-increasing rise in Health Service cost, the efficiency of the service be investigated. Mrs. J. Adams said the greatest resentment was directed at the foreign nationals and others who do not need a passport to come here and reap the benefits of the service. She had found that nationals from 15 foreign countries had obtained help in one year. Mr. F. A. Tomlinson claimed that in the vacation months an ever-increasing number of so-called working men went sick and drew $28 from the National Health Service in addition to their regular pay. An ever-growing number also imposed on the service through bulk compensation for industrial injury.

Center for Spastics.—The only training center in the world set up especially to train spastics for work in industry was officially opened at Welwyn, Hertfordshire, about 18 months ago. Since its opening it has fitted 20 young men and women, at one stage thought to be untrainable, for industrial jobs. In the workshop carpentry, light engineering, printing, and other technical subjects are taught. The center has accommodations for 32 spastics between the ages of 16 and 25, and there is a long waiting list. When students arrive, many of them cannot read or write, and all have physical disabilities which make the simplest process a heavy task. As well as being taught the skills for "outside" jobs, they have to be taught how to live. Many have got into the habit of lying in bed for most of the day. Frequently there is nothing else for them to do, and they are in the way of other members of their families if they get up. The strict schedule of the center (set times for meals, work, and learning) gives them their first idea of normal working life. In many cases they are given their first hope of being able to take part in that life. Finding jobs for the trained students is the biggest problem and slows down the work of the center. Employers are sympathetic but wary and fellow workers are apprehensive at first. The man in the street is too often ignorant even of what spastic means. There have been a few total failures, but after 18 months this center has established itself as a realistic training ground doing a sound and valuable job.

Alcohol and Driving.—Drew and co-workers examined the effect of small doses of alcohol on driving skill (*Brit. M. J.* 2:993, 1958). The apparatus used was a "Miles motor driving trainer," in which the subject sits in a dummy car facing a translucent screen in a darkened room. Behind the screen is a perspex disk with a road scene painted on it and this is projected, very much magnified, on the screen by a lamp. As the driver operates the accelerator and steering wheel the car appears to progress along the road. The apparatus used gives the illusion of driving along a mile of road. The aspects of performance scored were accuray of tracking, speed of driving, and the control movements of steering wheel, accelerator, brake, clutch, and gear lever. Records were also made of the number of collisions with the side of the road that would be likely to happen under normal driving conditions. The subjects tested, 40 volunteers from the staff of the Road Research Laboratory ranging in age from 23 to 40 years, were given a 20% solution of alcohol flavored to disguise the alcohol content. The dose ranged from 0.2 to 0.65 Gm. of alcohol per kilogram of body weight. The alcohol level was determined in the blood, urine, and breath at intervals over a period of two and one-half hours. The peak blood alcohol concentrations from the doses given were about 20, 40, 60, and 80 mg. per 100 ml. and the ratio of urine alcohol to blood alcohol was 1.25 to 1. The best results with breath testing apparatus were obtained with one known as the "breathalyser," which gave values corresponding closely to the blood alcohol values. The other forms of apparatus either showed high constant errors or were difficult to use.

Performance began to deteriorate with blood alcohol concentrations of the order of 20 to 30 mg. of alcohol per 100 ml., corresponding to an intake of 0.2 to 0.3 Gm. per kilogram of body weight. The deterioration was progressive and linearly related to blood alcohol level. There was no evidence of a threshold effect. The impairment in performance was shown most clearly in the operation of the controls, particularly in the timing of steering wheel movements. Mean error showed an increase with an increase in blood alcohol, amounting to about 16% deterioration with a blood alcohol concentration of 80 mg. per 100 ml. Part of the increase in error was due to a significant tendency which was pronounced in several. Sputum was expectorated more readily and physical signs, particularly dyspnea, improved in nearly 50%. The possibility of sensitization to the enzymes exists but appears to be remote.

Health Hazard from High-Power Radio Stations.—*The Times* reported that the operation of certain forward-scatter radio links to be set up in Britain under NATO arrangements may constitute a hazard to the health of the local community. Each of these high-power, two-way directional radio stations would have a sterilized zone in its beam extending a mile or so ahead of the station in the direction of the transmission. The public will not be allowed permanently in these zones, and any existing farms or homes in the immediate vicinity of the new radio stations would have to be evacuated. It is even suggested that "death rays" might be emitted in these new radio stations. The Ministry of Defense, on the other hand, minimized the danger and stated that there might be a slight radiation hazard from the introduction of new radio techniques and advised the fencing off of an area of about 40 yd. in depth in front of the transmitter cones. The matter is being taken up by the Medical Research Council, whose experts pointed out that the hazards are not as great as those of nuclear radiation. The energy emitted does not produce the same biological changes and as far as is known does not have any genetic effects on future generations. The Council stated that those who have been working with radar for nearly 20 years have not suffered from any ill-effects and that animal experiments show that this form of radiation must be of high potential to constitute a hazard to health.

Cytological Screening for Cancer of the Cervix.—A report from the Faculty of the College of General Practitioners of S. E. Scotland shows that the cytological detection of early cervical carcinoma can be readily undertaken in general practice, and that it is well worth while in view of the number of unsuspected cases of cancer brought to light. Twenty general practitioners took cervical smears from all women coming for postnatal examination, from postmenopausal women without a history of disease of the genital organs, and from as many women as possible in whom a complete medical examination was indicated. Cervical smears were taken from 1,000 women and the slides sent to Edinburgh University for pathological examination. There were 15 unsuspected positives; that is, those who had a healthy cervix on inspection and palpation, but whose cervical smear was either suspected of cancer or frankly malignant. Five atypical cases were also found. The average age of this group was 35½ years. These patients were immediately referred to a gynecologist for further treatment. Six underwent total hysterectomy, one wa treated with radium, and the rest were still unde observation, four of them having had the cervi amputated. This incidence of 1.5% unsuspected cases of cancer of the cervix detected in general practice was high. Figures from hospital surveys made in gynecologic departments were about half this. The general practitioners concerned were unanimous in their opinion of the value of the cervical smear as a routine screening test and considered that it should be part of every pelvic examination.

Cutting Health Service Costs.—Proposals for improving the National Health Service without increasing the cost were made in the first of a series of debates at the Local Government Conference in response to a paper by Sir Keith Joseph, M. P. Sir Keith referred to defects in the service and recommended that before going to the taxpayer for extra revenue, efforts be made to improve efficiency by modern management techniques. Specifying the drug bill in particular, he said that 10% of the total cost went for drugs and that a method should be found to make the public pay more of this cost. A false incentive was given by the relatively low charge of 14¢ for prescriptions when the prescribing cost alone was nearly 28¢. The charge must, however, be so arranged that it does not discourage recourse to the physician when necessary. The grievances of patients who wait hours at clinics to see a consultant for a few minutes were aired by Mr. P. Maybury, of Swansea, who said the consultants are not to blame as many are overworked. The system falls down for lack of coordination. Dr. Dulcie Staveley, herself a consultant who kept patients waiting, blamed the general public's lack of a sense of time, saying, "You can give them appointments and work out the average amount of time it takes to see them but you can't work out whether the average person will keep the appointment." Mr. W. Lindsay, vice-chairman of the East Sussex County Council, complained that benefits are given to people who do not need them. The patient should at least pay for his board and lodging in the hospital if he can afford to do so.

Mr. Walker-Smith, Minister of Health, described the service as generally efficient although methods of promoting efficiency are always being considered. When the Labor Government was in office not one hospital was in progress or planned. Today 10 are in progress and 11 planned; 31 major schemes of hospital extension and modernization are in progress, and 60 are planned. Regarding patients' waiting time the Minister said that a hospital could never be equated with a factory or the healing of the sick with the making of goods, but new techniques would be introduced where it was possible without detriment to the care and treatment of the sick. Five times as much is spent on drugs to keep patients out of hospitals as on drugs in hospitals. This gives a double benefit. This does not mean that costs should not be curtailed as far as possible without detriment to the patient. The speed and stress of modern life has increased the ratio of mental to physical illness. More than 40% of the hospital beds are devoted to mental cases. This is a great problem and challenge. More of these patients should be treated in the community rather than the hospital. Old people must be helped not only to live longer but to remain fit and active. Greater emphasis must also be placed on the prevention of illness.

At a Conservative Party conference Mr. Thompson, Parliamentary Secretary, Ministry of Health, stated that the big economies people want in the Health Service can be made only by closing hospital beds, charging for doctors' visits, or scrapping important parts of the service. Those who urge a better service at lower cost should not ask for the impossible. He was replying to a motion which urged that, in view of the ever-increasing rise in Health Service cost, the efficiency of the service be investigated. Mrs. J. Adams said the greatest resentment was directed at the foreign nationals and others who do not need a passport to come here and reap the benefits of the service. She had found that nationals from 15 foreign countries had obtained help in one year. Mr. F. A. Tomlinson claimed that in the vacation months an ever-increasing number of so-called working men went sick and drew $28 from the National Health Service in addition to their regular pay. An ever-growing number also imposed on the service through bulk compensation for industrial injury.

Center for Spastics.—The only training center in the world set up especially to train spastics for work in industry was officially opened at Welwyn, Hertfordshire, about 18 months ago. Since its opening it has fitted 20 young men and women, at one stage thought to be untrainable, for industrial jobs. In the workshop carpentry, light engineering, printing, and other technical subjects are taught. The center has accommodations for 32 spastics between the ages of 16 and 25, and there is a long waiting list. When students arrive, many of them cannot read or write, and all have physical disabilities which make the simplest process a heavy task. As well as being taught the skills for "outside" jobs, they have to be taught how to live. Many have got into the habit of lying in bed for most of the day. Frequently there is nothing else for them to do, and they are in the way of other members of their families if they get up. The strict schedule of the center (set times for meals, work, and learning) gives them their first idea of normal working life. In many cases they are given their first hope of being able to take part in that life. Finding jobs for the trained students is the biggest problem and slows down the work of the center. Employers are sympathetic but wary and fellow workers are apprehensive at first. The man in the street is too often ignorant even of what spastic means. There have been a few total failures, but after 18 months this center has established itself as a realistic training ground doing a sound and valuable job.

Alcohol and Driving.—Drew and co-workers examined the effect of small doses of alcohol on driving skill (*Brit. M. J.* 2:993, 1958). The apparatus used was a "Miles motor driving trainer," in which the subject sits in a dummy car facing a translucent screen in a darkened room. Behind the screen is a perspex disk with a road scene painted on it and this is projected, very much magnified, on the screen by a lamp. As the driver operates the accelerator and steering wheel the car appears to progress along the road. The apparatus used gives the illusion of driving along a mile of road. The aspects of performance scored were accuray of tracking, speed of driving, and the control movements of steering wheel, accelerator, brake, clutch, and gear lever. Records were also made of the number of collisions with the side of the road that would be likely to happen under normal driving conditions. The subjects tested, 40 volunteers from the staff of the Road Research Laboratory ranging in age from 23 to 40 years, were given a 20% solution of alcohol flavored to disguise the alcohol content. The dose ranged from 0.2 to 0.65 Gm. of alcohol per kilogram of body weight. The alcohol level was determined in the blood, urine, and breath at intervals over a period of two and one-half hours. The peak blood alcohol concentrations from the doses given were about 20, 40, 60, and 80 mg. per 100 ml. and the ratio of urine alcohol to blood alcohol was 1.25 to 1. The best results with breath testing apparatus were obtained with one known as the "breathalyser," which gave values corresponding closely to the blood alcohol values. The other forms of apparatus either showed high constant errors or were difficult to use.

Performance began to deteriorate with blood alcohol concentrations of the order of 20 to 30 mg. of alcohol per 100 ml., corresponding to an intake of 0.2 to 0.3 Gm. per kilogram of body weight. The deterioration was progressive and linearly related to blood alcohol level. There was no evidence of a threshold effect. The impairment in performance was shown most clearly in the operation of the controls, particularly in the timing of steering wheel movements. Mean error showed an increase with an increase in blood alcohol, amounting to about 16% deterioration with a blood alcohol concentration of 80 mg. per 100 ml. Part of the increase in error was due to a significant tendency for subjects to move toward the right of the road after taking alcohol. Mean speed showed no significant change after alcohol, although there were marked individual differences in speed. Age, sex, and previous driving experience and drinking habits showed no relation to individual differences in response to alcohol, but personality ratings, especially those relating to extroversion and introversion, were definitely associated with driving performance.

Extroverts did not change either speed or control movements much, though they were less consistent in control movements, but showed large increases in error. Introverts changed speed markedly, but it was not possible to differentiate between those who slowed down and those who speeded up. Control movements were also increased in introverts. Error increased in some and not in others, but the mean error score was significantly less than in the case of extroverts, who on the whole did not seem to be bothered by the extra stress imposed by alcohol. They drove at much the same speed as normally and made few additional corrective movements, but made much greater errors than introverts. They were less consistent in their behavior than the latter and deteriorated more rapidly. Introverts on the other hand appeared to strive to compensate for the effect of alcohol and to be anxious to demonstrate their efficiency. If anything they overreacted to the situation, made more corrective movements, and changed their speed markedly, some even slowing down in an attempt to achieve greater accuracy, although they did not necessarily do so.

BUSINESS PRACTICE

This is the tenth in a series of excerpts from the brochure on the Business Side of Medical Practice, prepared by the American Medical Association in cooperation with the Sears-Roebuck Foundation.

AS YOUR PRACTICE GROWS

As soon as it is financially possible, many physicians employ an office girl who can assume many of the routine duties of running the office, freeing the doctor to spend more time with his patients. She often serves as a combination office nurse, receptionist, secretary, and bookkeeper. She is particularly valuable in serving as the doctor's ambassador to his patients.

A few years ago an office aide was the exception rather than the rule—today four out of five practicing physicians employ at least one woman. This trend continues to increase as more doctors realize that managing a medical office means not handling all detail themselves but directing others to do much of it. Recent surveys point up the fact that physicians with office assistants can see more patients each day than doctors who go it alone.

As his practice grows, a physician may augment his office staff to include a registered nurse, in addition to a receptionist-secretary, a laboratory technician, or, perhaps, an x-ray technician.

Hiring an Aide

The first thing for a physician to consider when he reaches the point at which he is able to hire additional office help is "What duties do I want her to perform?" Depending on the kind of practice he has, some physicians may be primarily interested in a receptionist-secretary; others may prefer to employ a registered nurse who will spend a greater share of her time assisting with the medical side of the practice. Where a professional management consultant is available, it may be economical, in the long run, to seek such assistance in training office aides.

As a guide to physicians in hiring an assistant, Dr. Harold Mickelson, of Northeast Missouri State Teachers College, has worked up a list of more than 40 specific duties which an assistant might perform. His list is based on the results of a survey he conducted in cooperation with the American Medical Association to determine the ideal qualities, training, and skills of a medical secretary.

Here are just a few of the duties a girl often performs: (1) receives patients and office visitors; (2) answers the telephone; (3) makes appointments; (4) transcribes patients' medical records, histories, and similar data; (5) opens and sorts mail; (6) takes the doctor's letters; (7) prepares and mails financial statements to patients; (8) prepares insurance papers for doctor's signature; (9) pays office bills, makes bank deposits; (10) maintains daily and monthly financial records; (11) orders business and medical supplies; (12) handles office filing; and (13) operates equipment, such as mimeographs, in connection with the business side of the office.

On the medical side of the office she may (1) prepare patients for examinations; (2) weigh and measure patients; (3) take blood pressure, temperature, pulse rate; (4) assist the physician with minor medical procedures and surgery; (5) do routine laboratory tests and procedures; and (6) perform office "housekeeping duties," such as sterilizing instruments.

Depending on her particular type of medical training, she may operate such equipment as x-ray and electrocardiograph machines, give injections, or administer therapy of various types. However, the physician should always remember that he is responsible for the actions of any of his employees; all of her duties should be performed under his immediate supervision.

When the physician has prepared his own list of the duties he wishes his office aide to perform, his next step is to decide what kind of a woman he is seeking. He may want a young woman or he may prefer a more mature woman; he may have some personal preferences about educational background, special training, and personality qualities. The personality of the medical aide is of extreme importance. Because she is the doctor's key public relations person, she should be sincerely interested in people, friendly, and cheerful, as well as sympathetic and courteous. Her efficiency may be important, but it may be offset if she has the wrong kind of personality for the medical office.

How can a girl's personality qualities be determined? The doctor himself can rate her on appearance, voice, poise, intelligence, self-confidence, and similar personality qualities in his interviews with her. There are also interview guides and forms which a doctor can adapt to his own needs available from such companies as the Personnel Institute, 37 W. 47th St., New York, or the Psychological Corporation, 522 5th Ave., New York, if he wishes to use the job evaluation techniques of personnel experts.

There are many other qualities a doctor seeks in an ideal assistant. He looks for maturity, a quality not always determined merely by the age of the applicant. He searches for dependability, self-reliance, and composure, for he knows that there will be many times when he is out of the office and quick decisions about the way to handle a given situation must be made by the girl. She will need a sense of humor and patience to carry her through the difficult schedule of days, and she must be neat and accurate in all her duties. The ideal girl balances efficiency with personality.

Locating an Assistant.—When the doctor has carefully analyzed his own office needs, translated these into a detailed list of the duties he wishes an assistant to perform, and set down the personality qualities for which he is searching, he is ready to begin interviewing applicants. Where does he go to find job candidates who will qualify? Here are some suggestions: 1. Check with the local medical society and with colleagues who may know of girls seeking employment. 2. Check with local medical secretarial and medical assistant schools in the area. 3. Get the assistance of employment agencies. 4. Advertise in local newspapers or professional journals. 5. If there is a local medical assistants organization, contact its placement chairman. (A nationwide organization of doctors' aides, the American Association of Medical Assistants, now has state and local chapters in many states.)

In screening applicants, the physician should have each girl fill out a personal history form and should talk with her himself about her qualifications and the nature of the job. He will want to hold final interviews with the best applicants, and, when he narrows the selection down to one or two girls, he will wisely check with past employers for references.

Salaries.—Every young doctor is faced with deciding what to pay an aide. Few men establishing new practices are financially able to pay huge salaries. However, it is false economy to hire an unqualified girl merely because she will work for a small salary. Mistakes can be costly in a medical office and a poorly qualified office aide may even drive away patients.

The range of salaries for medical assistants varies around the country, just as do the range of physicians' incomes. A good general rule to follow is to pay on the same basis as a good secretary in business. Such information is easily obtainable from local employment agencies or from business friends who employ secretaries.

Though the doctor should have some salary schedule worked out before interviewing job applicants, he may find it necessary to alter it somewhat, depending on the experience, training, and personality of the girl he hires.

Some doctors prefer to employ a girl who has worked as a nurse in a local hospital or who has been employed by another doctor or just completed a training course in medical secretary–assistant work. Others prefer to take a young girl with relatively little training and teach her the job.

In addition to establishing equitable starting salaries, the doctor must also know when and how much to raise his employees' salaries from time to time in order to keep wages in line with those paid in the area and to provide continued job incentive. Too frequently raises are postponed until an assistant actually asks for a raise or becomes so dissatisfied she threatens to quit or actually does so. A raise in salary is an expression of appreciation for a job well done. With a comparatively small staff, some doctors find that individual salary raises from time to time are more effective than a blanket raise for all who work in the office. Some claim a raise is best given after an effective piece of work has been completed or just as the employee is leaving on her vacation. This garden-variety psychology is based on the premise that when an assistant leaves with an increased feeling of good will toward the office she will be anxious to return.

Other Job Incentives.—Most physicians offer sickness benefits, definite vacations, free medical care, and similar attractive benefits to their employees.

Some provide bonuses; others work out a percentage of collections arrangement for the girl who must follow up on collections, although this can lead to overaggressiveness on her part where patients are concerned. The physician is competing with industry and the business world for competent help, and consequently he, too, will find that fringe benefits are a real inducement in attracting well-qualified applicants.

Training an Aide

Too many doctors hire an office aide, then heave a great sigh of relief and say, "Now go to work." To do her job well she must be thoroughly trained in the specific office routine with her duties outlined clearly and specifically. A clear delineation of responsibilities must be made; this is especially important if a physician has more than one aide in the office.

Training an aide requires a liberal amount of understanding and patience. Some physicians even cut down on their case load to devote extra hours to the important training period, realizing that thoroughness at the beginning pays off later. The training period should emphasize showing, rather than merely telling the girl what to do. This entails explaining why certain things are done in the way they are done, rather than teaching by rote. A typed list of all her general duties and the schedule by which they are to be performed should also be provided the new girl.

Some doctors employ a girl for a trial period of a few weeks, so that both can see how the arrangement is working out. The moment a physician employs help, he becomes responsible for her social security deductions and payments, withholding tax deduction, workmen's compensation protection, and other insurances that may be required in his state. Information on these matters and the appropriate sources for the necessary forms is usually available from the county medical society.

If she handles patients' payments and bookkeeping duties, it is desirable to secure a bond for her, and it should be carefully explained that this is a protection for her as well as for the doctor.

During the training period, praise means a great deal to a girl who is trying to gain confidence on the job. She must be impressed with the importance of attention to detail and the absolute necessity for maintaining patients' office confidences. The doctor should correct her when she makes mistakes, but should not do so before patients. However, he should not expect her to learn everything the first day.

If the girl works out satisfactorily, she soon will become an important member of the office team and the doctor will wonder how he ever managed without his loyal, dependable office girl.

It is to his advantage to allow her occasionally to enroll in refresher courses sponsored by medical societies and medical assistants groups. He may even volunteer to pay her tuition for such postgraduate education, since in the long run it insures a better-run office and enhances the girl's pride in her work.

MEDICAL FILM REVIEWS

Life in a Cell: 16 mm., color, sound, showing time 13 minutes. Produced in 1956 by and procurable on purchase ($145) from World Wide Pictures, 4626 Van Nuys Blvd., Sherman Oaks, Calif.

The purpose of this film is to facilitate the teaching of the biological concepts of the basic life functions of a single-celled animal, the ameba. The film consists of a study, primarily by means of photomicrography, of a group of animals whose bodies are made up of just one cell, to learn how the basic life functions are performed in them. The biological concepts are considered in the form of questions: What does it mean to be alive? How can a single cell perform the basic life functions? How are the one-celled animals classified? Why are scientists interested in life in a single cell? Evidence is then presented that will direct the student toward scientific conclusions. This is an excellent film which would be very useful to create interest for discussion purposes. It is recommended for showing as a supplement to biology classes at the college and high school level. It could also be used at the junior high school level; however, for these classes considerable teacher supplement and vocabulary training would be required.

Cheiloplasty: Correction of Harelip: 16 mm., color, sound, showing time 24 minutes. Prepared by James W. Kelley, M.D., Tulsa. Produced in 1956 by Bud Woods Productions, Tulsa, for and procurable on loan from James W. Kelley, M.D., 204 Utica Square, Tulsa, Okla.

In this film, the method of operation for correction of harelip is demonstrated in detail and then the case of a 2-month-old child is presented. Each step of the procedure is shown, as well as the postoperative results. After this there is another demonstration of an operation done on an adult under local anesthesia. Here again, the steps of the procedure and the final results are shown. Included in the film are preoperative and postoperative photographs of several adults and children on whom cheiloplasty was performed. The techniques used are all acceptable and the photography is clear and allows the procedures to be seen easily. The sound and explanation are very good. The film can be recommended for general practitioners, pediatricians, and medical students.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Infarcts of the Pancreas. J. W. McKay, A. H. Baggenstoss and E. E. Wollaeger. Gastroenterology 35:256-264 (Sept.) 1958 [Baltimore].

This report is concerned with pancreatic infarction in the absence of acute necrotizing pancreatitis. The cases comprising this study were found among the records of 21,481 consecutive autopsies performed by the section of pathological anatomy at the Mayo Clinic during the years from 1924 through 1955. A thorough study of the autopsy protocols, anatomic specimens, photographs, and histological sections was made in all cases of pancreatic infarcts. An infarct was defined as tissue which had become necrotic because of impairment of its blood supply. The necrosis usually was of the coagulation type surrounded by a "zone of reaction" consisting of hemorrhage, dilated capillaries, and leukocytic infiltration. All the infarcts included were the size of one lobule or larger. The term "focal parenchymal necrosis" was used to designate necrotic acini in clusters smaller than one lobule. The term "focal fibrosis" was used to describe localized, fairly well-delineated areas of fibrous tissue, as opposed to diffuse interlobular fibrosis. The term "massive infarct" was used to describe instances in which one-fourth or more of the pancreas was involved. The term "malignant hypertension" was applied to cases in which the patient, during life, had had severe sustained essential arterial hypertension associated with edema of the optic disks.

Since isolated regions of acute hemorrhagic necrotizing pancreatitis could be confused with infarction, all instances of fat necrosis in extrapancreatic tissue or excessive peripancreatic or intrapancreatic hemorrhage were eliminated. Any evidence of diffuse inflammation of the pancreas in regions not immediately adjacent to infarcts was considered to be evidence of pancreatitis, and such cases were not included. Microscopic areas of fat necrosis, however, either isolated or adjacent to infarcts, were not eliminated, since they likewise could be ischemic in nature. Forty-one cases were found that fulfilled the required criteria; this represented an incidence of 0.19%. It was found that infarcts of the pancreas are most commonly associated with diseases characterized by occlusive lesions of the arteries, such as periarteritis nodosa and malignant hypertension. The relationship between infarcts of the pancreas and acute necrotizing hemorrhagic pancreatitis is not entirely clear, but this study indicates that lesions of each type may exist independently of the others and can be distinguished by their gross and histological appearance. It seems probable that, in some instances, pancreatic infarcts may produce significant clinical symptoms.

Among the 41 cases of pancreatic infarction, occlusive lesions of the arteries were found in 30 with thrombi or lesions of the arterial wall or both and in 3 with emboli. In the 8 cases with no demonstrable arterial occlusion, there was terminally either shock or congestive heart failure or both, which may have contributed to the production of ischemic infarction of the pancreas. The finding of frequent association of pancreatic infarcts with malignant hypertension and the failure to find any instance of acute necrotizing pancreatitis in 100 patients with malignant hypertension, studied by Hranilovich and Baggenstoss, seem to indicate that acute necrotizing pancreatitis is rarely caused by pancreatic infarction.

Observations on Staphylococcus Albus Septicemia in Mice and Men. I. M. Smith, P. D. Beals, K. R. Kingsbury and H. F. Hasenclever. A. M. A. Arch. Int. Med. 102:375-388 (Sept.) 1958 [Chicago].

Evidence obtained from cultures of blood of 9 patients affected with septicemia caused by Staphylococcus albus shows that this disease cannot always be dismissed as being due to contamination. A second culture should be taken, since overlooking a bacteremia due to this organism may have serious consequences for the patient. When the diagnosis of septicemia due to Staph. albus is made, it is necessary to determine the in vitro sensitivities of the isolated strain, as these sensitivities differ from strain to strain. The prognosis for the untreated patient is poor; therefore, prompt, carefully chosen, and prolonged antibiotic therapy is recommended. Death may occur late in the course of the disease, often unexpectedly, even though the blood stream has apparently been sterilized by treatment. Before the sensitivities are known, treat-

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

ment with novobiocin and chloramphenicol can be recommended, but it should not be started until in vitro sensitivity tests have been made to a wide range of antibiotics.

Predisposing factors were common in the patients with this disease, such as rheumatic fever, previous illnesses requiring operation, and other manifestations tending to impair the general condition. The sexes were affected in a ratio of 2 males to 1 female, which was similar to that for patients with septicemia caused by Staph. aureus. The symptomatology included dyspnea, cough, and sore throat. Some patients complained of a pleuritic type of pain; shoulder, knee, and ankle joints were most often painful; chills and rash were common. Involvement of the cardiovascular system was frequently found at autopsy. Experiments in mice with 3 strains of Staph. albus obtained from the blood of patients rarely led to the death of the animals and seldom produced obvious evidence of the disease. Further studies to solve the problem of this disease are recommended.

Haemorrhagic Capillary Disorder Associated with Antihaemophilic Globulin Deficiency. L. S. Valberg and G. M. Brown. Medicine 37:181-196 (Sept.) 1958 [Baltimore].

An investigation was made on a large family group, many members of which suffered from one of the commoner inherited hemorrhagic disorders of capillaries. The great-great-grandfather of the family was an Italian fisherman who bore the name of Alfredo Purpura. He and all but one of his children migrated to America. In all, 278 members have been traced, and these comprise the entire family, save for possible descendants of the daughter who remained in Italy. Some of the 4th generation still bear the name Purpura, and some of these are affected by the disease. Laboratory investigation was carried out on 35 members of the family in 3 generations. Inquiry into a possible hemorrhagic disorder was made in 60 other cases. The information obtained on the others varied in completeness and accuracy. A history of abnormal bleeding was given by 15 persons, 5 males and 10 females. In one other case abnormalities were found in the laboratory which were similar to those found in the cases with a positive history of abnormal bleeding. The bleeding in affected members of the family was generally mild, though one 9-year-old boy died because of prolonged epistaxis. The most common cause of trouble was tooth extraction, and 12 of 16 persons had had significant bleeding after this type of trauma. Bleeding from minor cuts had been a problem in 7 persons and epistaxis in 5. Tonsillectomy had been accomplished without difficulty in 2 persons but had been followed by hemorrhage in 4. There were 4 cases of excessive bleeding after major surgery (discotomy, appendectomy and cholecystectomy, hysterectomy and appendectomy, and hysterectomy), but in 4 cases major surgery (thyroidectomy, renal lithotomy, exploration of elbow joint, and appendectomy) was carried out without reported complicating hemorrhage.

Summarizing the studies on this family and of a review of the literature, the authors say that the disease occurs in both sexes and is transmitted as a simple dominant independent of sex. For the most part the clinical features are mild. Typical findings include a variable prolongation of the bleeding time and a blood clotting abnormality characterized by variable clotting and prothrombin consumption times and a consistent abnormality in the thromboplastin generation test confined to the barium-sulfate-treated plasma. Evidence that the coagulation defect in this condition is antihemophilic globulin deficiency is supported by assay procedures for antihemophilic globulin and by evidence that antihemophilic globulin and the factor in normal plasma which corrects the defect in a patient's plasma behave similarly on storage, heating, freezing, cooling, ammonium sulfate saturation precipitation, dialyzation, barium sulfate or aluminum hydroxide adsorption, and Seitz filtration. The administration of fresh blood and prednisone in one patient improved the coagulation and vascular defects sufficiently to permit discotomy and spinal fusion.

Consideration of the patients studied and the report in the literature of cases of primary hemorrhagic disorder characterized by a normal platelet count and by a prolonged bleeding time or by abnormal capillary fragility (or sometimes by both) leads to the distinction of 3 major syndromes: (1) a pure capillary disorder; (2) a capillary defect associated with an abnormality in the humoral factors of the coagulation mechanism; and (3) conditions in which there is a capillary defect and an abnormality in platelet form and/or function.

A Study of Heart Disease in One Hundred Eight Hospitalized Patients Dying With Portal Cirrhosis. J. H. Lunseth, E. G. Olmstead and F. Abboud. A. M. A. Arch. Int. Med. 102:405-413 (Sept.) 1958 [Chicago].

The incidence and type of heart disease were evaluated in 108 consecutive patients who had moderate to severe portal cirrhosis at the time of death. The ages of these patients ranged from 26 to 83 years, with a mean age of 57.4 years and a standard deviation of 13.7 years. Twenty-six were women, and 82 were men. The examination revealed that 52 patients (48%) presented portal cirrhosis associated with severe heart disease, which was arteriosclerotic in 26, hypertensive in 9, valvular in 5, and hypertrophic in 12. The latter 12 patients constituted a frequency of 32.4% of cardiac hypertrophy among the 37 cirrhotics of this series who were found to have no clinical or pathological evidence of hypertension or valvular or arteriosclerotic heart disease. These patients presented a clinical picture of both heart and liver disease. Shortness of breath, edema of the legs, ascites, and chronic cough occurring in both conditions made the precise assignment of symptoms to either the heart or the liver difficult. Paroxysmal nocturnal dyspnea and orthopnea, more typical cardiac symptoms, called attention to the heart disease in 2 of these patients. The outstanding clinical characteristic of this type of heart disease appears to be the occurrence of cardiac enlargement in the presence of portal cirrhosis and in the absence of known causes for cardiac enlargement, such as hypertension, valvular heart disease, or arteriosclerosis. Seven of these patients had cardiac enlargement demonstrated either on physical examination or by chest roentgenogram. Tachycardia in the absence of fever or significant anemia should lead one to suspect cardiac involvement associated with portal cirrhosis. Apical systolic murmurs were heard in 5 of these patients without gross or microscopic evidence of valvular heart disease, and in at least 2 of these the murmurs were associated with significant anemia. Electrocardiograms gave evidence of premature auricular and ventricular contractions and intraventricular conduction defects of varying degree.

One of the most salient findings in this study was the fact that the idiopathic cardiac hypertrophy was significantly more frequent in patients with early and moderately advanced cirrhosis than in those with far-advanced cirrhosis. Cardiac hypertrophy in these patients was believed to be due to the increased cardiac output associated with peripheral vasodilation in the early stages of portal cirrhosis. These findings suggest that patients with portal cirrhosis not only have the common types of heart disease but also are apt to develop an idiopathic heart disease associated with portal cirrhosis itself.

Urinary Delta-Aminolevulic Acid and Porphobilinogen in Different Types of Porphyria. B. Haeger. Lancet 2:606-608 (Sept. 20) 1958 [London].

The author discusses whether the presence of some porphyrin precursor earlier than porphobilinogen in the urine might not be a more reliable criterion of the porphyria-carrier trait than the presence of porphobilinogen. Recently Mauzerall and Granick found that the precursor of porphobilinogen, delta-aminolevulic acid, was also present in large amounts in the urine of 2 patients with acute porphyria. They accordingly devised a method for quantitative determination of this substance. This method was used in making quantitative determinations of delta-aminolevulic acid and of porphobilinogen in urine from 50 healthy adults, from 50 healthy children (aged from 7 months to 14 years), from 34 patients with acute intermittent porphyria, and from 128 of their closest relatives, as well as from 12 patients with porphyria cutanea tarda.

All patients with latent or manifest acute intermittent porphyria showed a pathologically increased excretion of porphobilinogen in the urine. This, therefore, appears to be an obligatory diagnostic sign. In two-thirds of the patients the excretion of delta-aminolevulic acid was also increased. In all apparently healthy but genetically certain carriers of the disease, the urinary excretion of porphobilinogen, and usually of delta-aminolevulic acid as well, was increased. This suggests that the disease can be transmitted only by persons with latent or manifest porphyria. A third of the apparently healthy children (below 15 years of age) of patients with latent or manifest acute intermittent porphyria had biochemical disorders suggestive of porphyria. It is noteworthy that so many of these children had latent porphyria, since manifest porphyria is very rare in this age-group. In patients with porphyria cutanea tarda the urinary excretion of delta-aminolevulic acid and of porphobilinogen followed no regular pattern. Determination of the porphyrin content of the urine and feces thus appears more useful in the biochemical diagnosis of this type of porphyria.

Peripheral Vascular Complications in Diabetes Mellitus: A Survey of 3,600 Cases. D. W. Kramer and P. K. Perilstein. Diabetes 7:384-387 (Sept.-Oct.) 1958 [New York].

The authors studied the problem of the relationship of diabetes mellitus and the incidence of peripheral vascular complications in 3,600 patients with diabetes mellitus seen in private practice and in hospitals in Philadelphia between 1921 and 1956. The ages of the patients ranged from 10 to more than 80 years, and their cases varied from potential to severe type. A progressive rise in the incidence of peripheral vascular complications from 8.8% between 1921 and 1930 to 47.3% between 1952 and 1956 was observed. This finding prompted the authors' attempt to obtain more information about the factors involved in the relationship of diabetes to peripheral vascular disease by examining the cases of 1,600 patients, observed between 1942 and 1956, according to duration of the diabetes, severity of the disease, age, and sex. Results showed that duration of diabetes alone is not a significant factor. The highest incidence of complications of the peripheral arterial system was in patients with diabetes of 1 to 5 years' duration. The next highest occurred in patients with diabetes of 6 to 10 years' duration. Similarly, the severity of the diabetes is not a definite factor, because the vast majority of complications have occurred in patients with milder forms of the disease. Age and sex do not offer any significant explanation for the rise of the incidence of vascular complications. The findings of the survey suggest that the basic cause for atherosclerosis might best be sought in other fields. Further investigations in the field of metabolic disorders, besides cholesterol and carbohydrates, may give added information.

Sarcoidosis of the Spinal Cord: Report of a Case with Remission Associated with Cortisone Therapy. A. Moldover. A. M. A. Arch. Int. Med. **102**:414-417 (Sept.) 1958 [Chicago].

While sarcoidosis is a relatively common disease, involvement of the spinal cord, which occurred in a 24-year-old man with sarcoidosis, is so rare that the case appears to be of interest. The patient noticed pain in his calves 5 months before he was first seen in consultation, followed by pain in his right hip and lower back. For the past two months he had had difficulty in walking a straight line; he could not stand on his toes, climb stairs, walk rapidly, or stand on one leg. One week previously impotency and difficulty in urination developed, and he consulted an urologist. The prostate was normal, but his urinary condition was diagnosed as a cord bladder. The patient complained of extreme general exhaustion and weakness.

Physical examination revealed a tall cachectic young man, walking with a shuffling gait, unable to lift his feet from the floor. A generalized lymphadenopathy, including cervical, axillary, and inguinal nodes, was found. There was no tenderness of the spinal column. Chest roentgenograms showed enlarged hilar lymph nodes and diffuse pinpoint opacities throughout both lung fields. The gastrointestinal series showed an enlarged spleen indenting the greater curvature of the stomach. Neurological examination revealed bilateral hyperalgesia, impaired sensitivity to pin prick and touch over the left saddle-seat area, normal abdominal but depressed cremasteric reflexes, and absent knee and ankle jerks. The Babinski response was normal. The protein content of the spinal fluid was 128 mg. per 100 cc., and the sugar content was 40 mg. per 100 cc. An inguinal lymph node was removed for biopsy, and histological examination was consistent with sarcoidosis. The patient was treated with corticotropin in daily intravenous injections of 25 mg. (1 mg.=1.14 U. S. P. units); the corticotropin was dissolved in 500 cc. of 5% dextrose in water and was given slowly during 8 hours for 8 consecutive days. A dramatic response was obtained on the third day of treatment when bladder function was restored to normal; the patient was able to walk normally, the exhaustion disappeared, and he was discharged from the hospital in a much improved condition. All the symptoms and signs returned 6 weeks later, though, and the patient was then given cortisone by the oral route: 300 mg. the 1st day, 200 mg. the next 2 days, and 150 mg. for the next 10 days. The daily dose of cortisone was then reduced to 100 mg. Two days later insomnia developed, and a dose of 75 mg. was given. Two grams of potassium chloride was also administered daily. As before, the reaction to steroid therapy was excellent and was manifested by marked increase in appetite after administration of the first dose of the drug.

The disease in this patient was characterized by the alternation of prompt remissions when steroid therapy was given and relapses whenever it was stopped; after 2½ years of treatment cortisone was withdrawn. One and a half years after termination of the therapy, the roentgenograms showed for the first time normalization of the lung, the neurological findings were negative, and the patient resumed normal sexual activity. The results obtained with steroid therapy in this patient with sarcoidosis indicate its value in this condition.

Familial Congenital Hyperplasia of the Adrenal Cortex. G. Birke, E. Diczfalusy, L.-O. Plantin and others. Acta endocrinol. **29**:55-69 (Sept.) 1958 (In English) [Copenhagen].

The authors report on a family consisting of the parents, aged 47 and 44 years, and of 6 children, 3 of whom, aged 15 years, 12 years, and 8 weeks, had congenital hyperplasia of the adrenal cortex manifested as female pseudohermaphroditism; the other 3 children, 2 girls, aged 13 and 10 years, and 1 boy, aged 8 years, were normal both in weight and height and concerning their sex organs. Analysis of the steroid secretion in the urine was done in all 8 members of this family. The father, mother, and 3 healthy children showed a normal excretion pattern of 17-ketosteroids, 17-hydroxycorticosteroids, androgens, and estrogens. The youngest of the 3 female pseudohermaphrodites died before any steroid analyses could be carried out. The other 2 children with adrenocortical hyperplasia showed a substantially increased excretion of both 17-ketosteroids and 17-hydroxycorticosteroids as well as pathological changes of their excretion patterns. Androsterone showed a greatly increased output, but etiocholanolone could not be identified with certainty. The increased excretions of 11-oxy-17-ketosteroids consisted mainly of those of 11-keto-etiocholanolone and 11 beta-hydroxyandrosterone which were isolated and identified by infrared spectroscopy; 11 beta-hydroxyetiocholanolone could not be detected. An indirect analysis of the 17-hydroxycorticosteroid pattern revealed the presence of large amounts of pregnanetriol. Measurable amounts of pregnan-3 alpha,17 alpha,21-triol-20-one (tetrahydro-S) were also observed in the urine. In neither of these 2 children was the excretion of the latter accompanied by hypertension. Tetrahydrocortisone and 11-keto-pregnan-3,17,20-triol were also identified, but no 11 beta-hydroxylated corticosteroids could be detected. The estrogen pattern was characterized in both patients by the complete absence of estriol. The older patient, who grew up as a girl, showed pronounced masculinization at the age of 14 and underwent bilateral subtotal adrenalectomy; after this operation substantial amounts of estriol were detected in the urine.

The assays in these 2 patients with adrenocortical hyperplasia thus revealed a partially new steroid excretion pattern characterized by the presence of tetrahydro-S despite the absence of hypertension, a defect in the 11 beta-hydroxylating mechanism, a dichotomy between androsterone and etiocholanolone excretion, and a disturbed estrogen pattern. These findings and those reported by other workers suggest very strongly that in congenital adrenocortical hyperplasia a number of different defects may arise in the enzymatic systems of the adrenal glands, more or less marked in different cases. Although a defect in the formation of hydrocortisone from its precursors appears to be a common factor in most of the patients with adrenocortical hyperplasia, various additional enzymatic defects, giving rise to different types of steroid patterns, also appear to be present.

Marfan's Syndrome. F. Erichsen and P. Svane-Knudsen. Ugesk. laeger 120:1121-1126 (Aug. 21) 1958 (In Danish) [Copenhagen].

Arachnodactyly or congenital mesodermal dystrophy (Marfan's syndrome) designates a constitutional anomaly of hereditary character. In patients without cardiovascular complications or grave kyphoscoliosis, the prognosis for life is considered good. Since there is ectopia lentis in 50 to 75% of the cases, the state of vision often becomes decisive for the prognosis as to ability to work. Report is given on 9 patients with Marfan's syndrome whose typical cases have not previously been described. These patients represented 3 families, and information was also available on 10 relatives with the anomaly. Of the 2 patients with kyphoscoliosis, one died 2 weeks after the examination, probably of cor pulmonale. No cardiovascular lesions were demonstrated in the 8 surviving patients. Marfan's syndrome should be borne in mind, especially in mass examinations of school children or in the practice. Children with the anomaly can be helped by regular consultations with orthopedist and ophthalmologist and by advice as to choice of career. Many persons with the disorder are fully able to work, even at physically demanding occupations.

SURGERY

Leiomyosarcoma of the Stomach. L. W. Mason and V. R. Jablokow. J. Internat. Coll. Surgeons 30:285-293 (Sept.) 1958 [Chicago].

The incidence of leiomyosarcoma of the stomach is about the same in both sexes, and the age of onset is usually one decade earlier than that of carcinoma. The prognosis after surgical removal (leiomyosarcoma is not a radiosensitive tumor) is relatively good. In this discussion 3 patients are alive and well 4, 7, and 8 years, respectively, after operation. Early diagnosis is extremely important and can be made by gastrointestinal hemorrhage, epigastric distress resembling peptic ulcer, a palpable epigastric mass, roentgenologic evidence, gastroscopic examination, and laparotomy. Distress is usually relieved by taking food and frequently by taking alkali in spite of achlorhydria (present in about 25% of cases). These tumors may vary from 2.5 to 25 cm. in diameter, are lobulated or nodular and rubbery, and may be found anywhere in the stomach, although rarely in the pyloric and cardial areas. They are usually less fixed and less hard and nodular than carcinoma. Roentgenologic diagnosis can rarely be accurately accomplished. In these 3 cases it could only be stated that a filling defect was present. Hypochromic macrocytic anemia is usually present, often in direct proportion to the duration of the disease. Usually there is no relation to gastric acidity. Free hydrochloric acid is lacking in the patient with leiomyosarcoma of the stomach more frequently than in the normal person, but it is much less common than in patients with carcinoma. Appetite usually remains good, and loss of weight occurs late or not at all. Many patients appear to be in good physical condition even in the terminal stages. The leiomyosarcoma is a slow-growing tumor, prone to metastasize late, although it infiltrates locally. It is usually encapsulated and spreads by displacement rather than by invasion.

Venous Shunts in the Surgical Management of Bleeding Esophageal Varices. R. W. Youngblood. J. Tennessee M. A. 51:357-364 (Sept.) 1958 [Nashville].

The author reports on 9 female and 15 male patients with portal hypertension associated with esophageal varices who underwent 25 venous shunting procedures (11 portacaval and 14 splenorenal shunts) at the Vanderbilt University Hospital in Nashville, Tenn., between May, 1951, and March, 1958. Twenty-one of the 24 patients had intrahepatic block, and only 3 had extrahepatic block. Of the 21 patients with intrahepatic block, 12 had Laennec's or alcoholic cirrhosis, 5 had posthepatic cirrhosis, 3 had biliary cirrhosis, and 1 had cirrhosis whose cause was unknown. Of the 3 patients with extrahepatic block, 2 were children with thrombosis of the portal vein secondary to omphalitis, and 1 was an adult with cavernomatous transformation of the portal vein. Preoperatively all patients except one had an average of 2 attacks of major hemorrhage. The surgical procedure usually consisted of end-to-side anastomosis with continuous, nonabsorbable suture material.

There were 2 operative deaths; one patient died 8 days and the other 15 days after the operation, both in hepatic coma. Three other patients died, one 8 weeks after the operation and two 4 years after the operation. Autopsies were performed on 4 of the 5 patients, and the shunt was patent in each of them. None died of hemorrhage. Only 2 other patients had subsequent bleeding during follow-up periods ranging up to 7 years; in one of these, bleeding followed thrombosis of a splenorenal shunt, the only instance of thrombosis in the entire series. The relatively low mortality rate and the rarity of complications and recurrent bleeding or thrombosis of the shunt are impressive when contrasted with older series of patients under nonsurgical management, who had mortality rates varying from 50 to 80%. Emphasis should be placed on the fact that bleeding is the most frequent cause of death in patients with esophageal varices. Therefore, venous shunting should no longer be considered as a palliative procedure, since other complications of cirrhosis may now be largely controlled with modern medical management. Portal-systemic shunts are feasible, with a low mortality rate even in poor-risk patients with cirrhosis. Liver function and ascites are infrequently improved by a shunting procedure alone but may be improved by medical means.

Transection of the Hypophyseal Stalk in the Management of Metastatic Mammary Carcinoma. G. S. Dugger, J. Van Wyke and J. F. Newsome. Am. Surgeon 24:603-608 (Sept.) 1958 [Baltimore].

Hypophysectomy has been known to be followed by improvement in 50% of patients with metastatic breast carcinoma; however, total hypophysectomy is difficult and is not always achieved. The authors review attempts to achieve functional hypophysectomy, and, on the basis of experimental evidence, the procedure they used to cause a functional hypophysectomy consisted of transection of the infundibular stem or hypophyseal stalk and the placement of a disk of impervious material across the sella turcica. Thus, the revascularization of the hypophysis by vessels from the hypothalamus, specifically the vessels of the hypophyseal portal system, became unlikely.

Beginning in July, 1955, this operation was performed on 15 patients with advanced metastatic carcinoma of the breast. Endocrine function was assayed preoperatively and in the patients who survived sufficiently long postoperatively. Studies were made of the uptake of radioiodine (I^{131}) and protein-bound iodine, of the excretion of gonadotropins, 17-ketosteroids, and 17-hydroxycorticosteroids, and of the response of plasma 17-hydroxycorticosteroids to the adrenocorticotropic hormone. Six of the 15 patients with metastatic mammary carcinoma showed a remission, 4 gained no benefit, 1 died as a result of the operation, and in 4 patients the operation was too recent to permit evaluation. Average duration of remission was 6.6 months. This was less than that reported for total hypophysectomy but will probably improve with better selection of cases. Whether the quality of the remission is the same as that after total hypophysectomy has not been determined.

The Surgical Treatment of Cushing's Syndrome. F. Glenn, R. C. Karl and M. Horwith. Ann. Surg. 148:365-374 (Sept.) 1958 [Philadelphia].

Thirty-two patients with adrenal cortical hyperfunction (Cushing's syndrome) have been evaluated during the past 24 years at the New York Hospital-Cornell Medical Center. All but 2 were women. The peak age of incidence was in the 4th decade. The most common physical complaint with muscular weakness or fatigue, which in 3 patients resulted in extreme disability. A 52-year-old woman had such severe muscular weakness that neurologists had entertained such diagnoses as muscular dystrophy and peripheral neuritis. Amenorrhea or menstrual irregularities developed in 24 of 28 women who were experiencing normal menstrual periods prior to the onset of their symptoms. A moon facies was noted in 25 patients, while truncal obesity with supraclavicular and cervicodorsal fat pads and thin tapered extremities occurred in 19. Facial and body hirsutism was frequently seen. Scalp hair tended to pull out easily. Atrophic skin, facial plethora, acne, and increased bruisability were common, but purple striae occurred in only 9 instances. Psychiatric problems varied from increased irritability to severe depression. Since an adequate method of determining serum and urinary 17-hydroxycorticoid levels has become available, this has been the most useful laboratory examination in the diagnosis of Cushing's syndrome. The 17-hydroxycorticoid values were elevated in 19 of the 22 patients in whom the test was employed, and the urinary 17-ketosteroid levels were increased in 15 of 28 patients. Other frequently encountered laboratory findings were diabetic glucose tolerance responses, eosinopenia, leukocytosis, increased insulin resistance, lymphopenia, alkalosis, and polycythemia. There were 14 instances of osteoporosis.

No satisfactory medical therapy is available for Cushing's syndrome, but excision of the hyperfunctioning adrenal cortical tissue has frequently induced permanent remission. Thirty of the 32 patients were operated on, the authors favoring a lateral incision with resection of the 12th rib. Transabdominal exposure of the adrenal glands is reserved for patients with severe osteoporosis who cannot be placed in the lateral position without risking a compression fracture of a vertebral body and damage to the spinal cord. One of the first patients had what appeared to be normal adrenals, and only biopsy specimens were taken. This was a 9-year-old boy who subsequently underwent a spontaneous remission. Twenty patients had a total adrenalectomy. Nine patients underwent unilateral adrenal resection for either adenoma or hyperplasia. There were no deaths among the patients treated surgically. The duration of cortisone therapy varied from 2 days to several weeks in patients in whom adenomas were resected.

Within weeks after adequate surgical therapy, there is a redistribution of body fat, so that a more normal appearance is soon evident. Muscular strength slowly improves, and normal menstrual periods return. Osteoporotic bones gradually recalcify. The blood pressure often returns to normal levels. Although facial hirsutism usually subsides completely, it persisted in some patients. A persistent low-grade fever, sometimes accompanied by mild diarrhea, was experienced by some of the totally adrenalectomized individuals. In 3 patients who had both adrenals excised, transitory hypercalcemia and hyperphosphatemia developed postoperatively and was accompanied by such symptoms as fever, anorexia, nausea, vomiting, muscular weakness, polydipsia, and polyuria. In one patient, in whom all but a small remnant of adrenal tissue was removed, there developed 3½ years later a complete ophthalmoplegia on the right and bitemporal hemianopsia. The spinal fluid was bloody, and skull x-rays revealed an enlarged sella turcica which had not been present previously. Diabetes insipidus then became evident. A craniotomy was performed, and the clinical impression of a hemorrhage into a basophilic adenoma was confirmed. When adequate medical facilities are available, totally adrenalectomized patients can be maintained safely.

Cortisone as Cover for Major Surgery in Advanced Pulmonary Tuberculosis. J. R. Edge. Lancet 2:604-605 (Sept. 20) 1958 [London].

The author reports on 17 patients (14 male and 3 female) with far-advanced pulmonary tuberculosis for whom major surgery was considered to offer the only real hope of permanently arresting the disease. Their ages ranged from 26 to 58 years. The operations carried out were pneumonectomy in 5 patients, lobectomy in 4, local excision of cavity in 1, and thoracoplasty in 7. The patients have been followed up for from 6 to 21 months after operation. When the resting 24-hour 17-ketosteroid excretion was found to be low, cortisone therapy by mouth was started 3 days before operation in a daily dose of 100 mg. (25 mg. every 6 hours); this dosage was continued for a week after operation and then reduced, in weekly steps of 25 mg., to 75, 50, and a final 25 mg. daily. The total duration of treatment was 4 weeks. There were 3 postoperative deaths from definitive complications unrelated to stress. The remaining 14 patients had no postoperative complications, apart from transient basal collapse in one instance. The postoperative course was remarkably free of incident; the patients remained free of fever, dyspnea, hypotension, and tachycardia and on the day after operation looked and felt none the worse for the operation. The pink color and lack of any suggestion of dehydration were particularly striking. Wound healing proceeded quite normally in all patients. It is suggested that the replacement of deficient endogenous adrenal secretion contributed substantially to the recovery of the patients.

Clinical Aspect and Therapy in Patients with Tuberculosis of the Cervical Lymph Nodes. E. Beck, H. Behrendt and J. Kastert. Tuberkulosearzt 12:573-580 (Sept.) 1958 (In German) [Stuttgart, Germany].

The authors report on the results of combined surgical and tuberculostatic treatment in 949 patients, ranging in age from 10 to 60 years, with tuberculosis of the lymph nodes who were admitted to the sanatorium "Sonnenwende" in Bad Dürkheim, Germany, between 1949 and 1957. Treatment consisted of skin incision in the direction of folds of the skin, removal of the surface abscesses of caseous necrosis, and wide dissection of all palpable and visible subjacent lymph nodes. Roentgenograms before or during the operation helped to locate the calcified lymphomas. Complete extirpation of all caseous lymph nodes is necessary in order to guarantee a complete cure. Preceding the closure of the wound, streptomycin (0.5-1.0 Gm.), isoniazid (0.25-0.5 Gm.), and penicillin (200,000-400,000 units) were applied to the wound. Tuberculostatic therapy with streptomycin and isoniazid was started 3 to 5 days before the operation and was continued for the whole period of hospitalization. After the operation amithiozone (Conteben) was substituted for streptomycin, but, if liver damage existed, aminosalicylic acid (PAS) was used; cycloserine was recently given a trial.

Of the 949 patients, 553 had received previous treatment, while 396 had had no treatment. In 50% of the pretreated patients no tuberculostatic therapy had been given, and in 70% tonsillectomy had been omitted. Two hundred forty-five patients had received irradiation treatment without any success, and in 97 fistulas had developed. In all patients who had received irradiation treatment, connective tissue changes occurred and rendered operation more difficult. All the patients who had received previous irradiation still had palpable lymph nodes which made surgical treatment necessary. Of 450 patients with involvement of one group of lymph nodes, 447 obtained complete cure, and 3 had recurrences. Of 222 patients with unilateral generalized lymph node involvement, 165 obtained complete cure, and 10 had recurrences. Of 112 patients with bilateral generalized lymph node involvement, 80 obtained complete cure, and 7 had recurrences. Of 41 patients with involvement of several groups of lymph nodes in nonadjacent areas of the body, 37 improved, and 4 had recurrences. The incidence of recurrence depended more on the extent of the tuberculous process, i. e., the number of groups of lymph nodes involved, than on the more or less advanced stage of the lesions; the incidence of recurrence definitely depends on the possibility or impossibility of complete surgical removal.

Early surgical intervention is recommended, not only to prevent disfiguring scars but also to shorten the toxic contamination of the entire organism by the tubercle bacilli. Irradiation therapy has lost its value in an era in which operative removal of tuberculous foci has become possible with the aid of tuberculostatic agents.

Tumors of the Carotid Body (Chemodectomas). E. Lima Basto. Arq. pat. 30:305-334 (July) 1958 (In Portuguese) [Palhava, Lisbon].

Tumors of the carotid body, so-called chemodectomas, are rare. As a rule, they appear in persons of either sex, between the ages of 20 and 50 years, are unilateral (on the left side of the neck), and are either unilobular or multilobular. Externally the tumor grows very slowly, but internally it causes massive involvement and compression of the carotid artery and its bifurcation, the nerves, regional lymph nodes, the muscles, larynx, and pharynx. These tumors are histologically benign, but they may become malignant and result in metastases. Radium and roentgen-ray treatments are ineffective. The best treatment is surgical.

Three men with tumor of the carotid body were observed at the Hospital of the Instituto Portugués de Oncologia, of Lisbon, during the period 1956-1957. They were between the ages of 19 and 35 years. One of the patients occasionally had convulsions on the left side of the face and in the left arm. The tumors had appeared 5 or 6 years before consultation. They were unilateral and about the size of an orange. The cervical and submandibular lymph nodes were enlarged in all cases. Biopsy of these nodes showed either chronic lymphadenitis or atypical forms of lymphogranuloma. There were no metastases in any of the patients.

Operation consisted of dissection of the tumor, with conservation of the carotid artery in one patient in whom it was found that the tumor was causing compression of the carotid artery without entering its wall. In the other 2 patients, the tumor had involved the carotid wall; the carotid artery was ligated and resected in order to make possible complete extirpation of the tumor. There were no postoperative deaths. After the operation 2 patients continued in good health. The patient who had occasional convulsions before the operation was hospitalized 6 weeks afterward with a syndrome of intracranial hypertension. A decompressive craniotomy failed. An autopsy showed multicentric diffuse gliomatosis. There were no cerebral metastases of the tumor of the carotid body. The author advises an early operation before the tumor involves the carotid.

Primary Chief-Cell Hyperplasia of the Parathyroid Glands: A new Entity in the Surgery of Hyperparathyroidism. O. Cope, W. M. Keynes, S. I. Roth and B. Castleman. Ann. Surg. 148:375-388 (Sept.) 1958 [Philadelphia].

Originally hyperparathyroidism and an adenoma of a parathyroid were regarded as synonymous, since, until 1933 no other type of anatomic disorder of the parathyroid glands was reported in patients with hyperparathyroidism. Beginning in 1934 and subsequently, other lesions of the parathyroids have been recognized. Since 1952, 10 patients with primary hyperparathyroidism have been encountered with a type of parathyroid hyperplasia distinct from adenoma, carcinoma, and the water-clear cell hyperplasia. All the parathyroid glands are enlarged by the disease process, the cells are predominantly of the nonvacuolated chief-cell type, and the entity is being called "primary chief-cell hyperplasia." It is essential that the entity be recognized at operation if secondary operations are to be avoided. The enlargements are most readily confused with adenoma, especially if only one gland is exposed. Five per cent of the first 200 patients with primary hyperparathyroidism cared for at the Massachusetts General Hospital in Boston have turned out to have this condition.

Four of the 10 patients with primary chief-cell hyperplasia also had tumors of the pancreas and pituitary gland, and it is suspected that this condition, previously described as "adenomatous hyperplasia" and "multiple adenoma," will prove to be the common type of parathyroid disease in patients with multiple endocrine abnormalities. Grossly, the cut surfaces of the individual glands present an ill-defined nodularity, which is more evident microscopically. The gross and microscopic appearance of a single gland may be insufficient to distinguish chief-cell hyperplasia from adenoma, and examination of all 4 parathyroid glands may be necessary to establish a definite diagnosis. The surgical treatment consists of total resection of 3 glands and a subtotal resection of the 4th.

Prescalene-Lymph-Node Biopsy. J. T. Wilson, E. G. Laforet, and J. W. Strieder. New England J. Med. 259:615-618 (Sept. 25) 1958 [Boston].

Prescalene lymph node biopsy was performed in a series of 153 patients with intrathoracic disease at Boston City Hospital. There were 148 cases in which lymphoid tissue was identified. Of these, 29 (20%) yielded histological evidence of the underlying pulmonary disease. Prescalene node biopsy was successful in 18% of the cases in which all other diagnostic methods short of exploratory thoracotomy had been unavailing. It is believed that, in view of the minimal risk, good diagnostic yield, and important prognostic significance, prescalene lymph node biopsy continues to be justified in the presence of intrathoracic disease. On appropriate indication the biopsy may also constitute a useful diagnostic adjunct in the patient who is hospitalized for pulmonary tuberculosis. In the present series of 20 patients undergoing this procedure, positive diagnostic information was obtained in 7. The yield of significant histological data was highest when the underlying pulmonary disease was sarcoidosis and lowest when it was tuberculosis. Bronchogenic carcinoma occupied an intermediate position.

The major indications for prescalene lymph node biopsy in patients hospitalized for pulmonary tuberculosis are as follows: inability to obtain bacteriological confirmation of the diagnosis of pulmonary tuberculosis, thus indicating that search for nontuberculous disease be intensified; x-ray findings suggestive of bronchogenic carcinoma; delay in x-ray improvement despite adequate medical therapy; and unexpectedly good clinical condition in the presence of roentgenologically extensive pulmonary disease. Bacteriological study of the cut surface of the resected lymph nodes is occasionally of value and should be performed more frequently. Although not done in this series, mycologic study of the resected lymph nodes is also recommended when the diagnosis is obscure.

Syndrome of Left Ventricular–Right Atrial Shunt: Successful Surgical Repair of Defect in Five Cases, with Observation of Bradycardia on Closure. F. Gerbode, H. Hultgren, D. Melrose and J. Osborn. Ann. Surg. 148:433-446 (Sept.) 1958 [Philadelphia].

A membranous ventricular septal defect which has its major flow into the right atrium has been recognized for many years. Recent advances in intracardiac surgery have made it possible to close such defects. This paper describes the essential clinical features of 5 instances of left ventricular–right atrial shunt. All were successfully closed with the aid of extracorporeal circulation. The first patient was a boy, who was first seen at the age of 10 years for the evaluation of a heart murmur. At operation at the age of 15, a small septal defect was found penetrating the septal leaflet of the tricuspid valve near its margin of insertion. The heart was stopped and the defect repaired under direct vision. After closure of the atrial incision, ventricular fibrillation appeared, but this was effectively reversed by cardiac massage and electrical defibrillation. Four months after surgery, the boy was asymptomatic even during strenuous activity.

In the second patient, a girl, the mother had discovered a heart murmur when the child was 18 months old. Operation at the age of 10 years revealed a defect in the upper margin of the septal leaflet at the tricuspid valve. This defect could be closed easily with the index finger, eliminating the thrill, slowing the heart, and raising the systemic blood pressure. It was decided that this lesion could best be corrected with the use of extracorporeal circulation. The operation was, therefore terminated and the patient allowed to recover. At the second operation, 8 months later, with the aid of extracorporeal circulation, the opening between the left ventricle and the right atrium was closed with interrupted sutures. There was also a defect in the upper margin of the septal leaflet of the tricuspid valve directly overlying the opening. The atrium was repaired and the heart restarted in normal sinus rhythm. There has been a remarkable improvement in physical capacity.

The third patient, a 5-year-old boy, had severe symptoms due to plumonary congestion, and there was doubt whether or not he would survive. Postoperatively he has shown remarkable improvement. The fourth patient was a 42-year-old man. He had severe cardiac symptoms; the physical signs were a ventricular septal defect. Catheterization data suggested an atrial septal defect. Postoperative recovery was uneventful, and there was no residual murmur. The fifth patient, a 17-year-old Eskimo girl, had a left ventricular–right atrial shunt which on catheterization was interpreted to be a ventricular septal defect.

The high ventricular septal defect associated with a defect of the septal leaflet of the tricuspid valve allows left ventricular blood to enter the right atrium. Of unusual interest was the finding that on manual closure of the defect there was a bradycardia and rise in systemic blood pressure. This phenomenon, previously described by Nicoladoni and Branham on closure of a peripheral arteriovenous fistula, has been thought to be due to the elimination of the reduced peripheral resistance at the fistula, which allows the full output of the left ventricle to pass into the systemic circulation. This causes stimulation of the carotid sinus mechanism and the depressor nerves, which then reflexly, through the vagus, slows the heart. It is believed that the effect shown here is similar physiologically to that observed on closure of an arteriovenous fistula, for the left ventricular–right atrial shunt is essentially an internal fistula. This phenomenon was observed in all 5 patients operated on.

Surgical Considerations of Occlusive Disease of the Abdominal Aorta and Iliac and Femoral Arteries: Analysis of 803 Cases. M. E. De Bakey, E. S. Crawford, D. A. Cooley and G. C. Morris Jr. Ann. Surg. 148:306-324 (Sept.) 1958 [Philadelphia].

This report is concerned with observations derived from an analysis of surgical experience during the past 5 years with 803 cases of occlusive disease of the aorta and iliac and femoral arteries. The obstructing lesion in chronic arteriosclerotic occlusive disease of the lower extremities was usually well localized and segmental in nature. There were 2 major groups of lesions, namely, aortoiliac occlusion and femoral occlusion. In the former group of 448 cases, 44% were characterized by complete aortic occlusion and 56% by incomplete occlusion. Associated occlusive disease of the peripheral arterial bed was present in 18% of these cases and was more frequently encountered in patients with incomplete aortic occlusion. Arteriographic studies were important in providing precise knowledge concerning location and extent of occlusive process to permit effective therapy.

Treatment of aortoiliac occlusive disease was directed toward restoration of normal circulation. Three types of surgical procedure were employed, namely, thromboendarterectomy, excision with graft replacement, and bypass graft. It was found that the indications for each of these procedures were dependent on location, extent, and nature of the occlusive process as well as on certain systemic factors; lumbar sympathectomy was a desirable supplemental procedure when there was associated peripheral disease, with secondary narrowing or occlusion in the smaller distal part of the arterial bed. The results of surgical treatment in aortoiliac occlusive disease were excellent. Circulation through the major arterial channels was restored in about 95% of the patients. Associated cardiac and renal disease constituted the major cause of operative mortality in 2.7%. Cardiac disease, mostly in the form of coronary thrombosis, was also the primary cause of death among the 9 patients whose late deaths occurred from 1 to 30 months after discharge from the hospital. The long-term results in these cases of aortoiliac occlusion have been satisfactory, as evidenced by the fact that recurrent occlusion was encountered in only 8 patients after varying periods ranging from 3 to 27 months. In all but one of these patients, who refused operation, the circulation was restored by a second operative procedure consisting of a bypass graft.

The pathological features of femoropopliteal occlusive disease vary, but certain patterns may be recognized. They may be classified into 3 groups: (1) those in which the occlusive lesion is discrete and well localized with relatively normal arterial elements above and below the occlusion; (2) those in which the process involves a considerable portion, if not most, of the superficial femoral artery but with patency of the popliteal artery and the distal part of the arterial bed; and (3) those with still more extensive and diffuse obliterative disease extending well down into the smaller vessels of the calf. Arteriographic studies are essential in the recognition and in the surgical treatment. Patients in the first 2 groups are amenable to treatment directed toward restoration of normal circulation, whereas those in the third are not and may be best treated by lumbar sympathectomy. Thromboendarterectomy may be satisfactorily employed in those in the first group, but in the second the bypass graft is the procedure of choice.

Of the 353 patients with occlusive disease of the femoral artery, 90% were treated by means of the bypass graft. Excision and graft replacement, which was employed in 19 cases in the early period of this experience, has been virtually abandoned in favor of the bypass graft. Endarterectomy is still considered a desirable procedure, but conditions in which it is indicated are rarely observed. Despite the greater difficulties imposed by this form of occlusive disease as compared with the more proximal form, the results of treatment have been gratifying, with restoration of normal pulsatile circulation in 84% of the patients. Long-term results were also satisfactory, as evidenced by the fact that recurrent occlusion was observed in only 14% of the patients over a period of 3 weeks to 38 months after discharge from the hospital. A second operation was performed on 27 of the 41 patients with late failure, and restoration of circulation was achieved in 20 patients.

Primary Splenic Pancytopenia: Dramatic Effect of Splenectomy. J. Tapie, J. Monnier, J. Poulhes and others. Presse méd. 66:1389-1392 (Sept. 13) 1958 (In French) [Paris].

The beneficial effect that may be exerted by splenectomy in patients with primary splenic pancytopenia was strikingly illustrated in the case of a 16-year-old girl whose life was endangered by repeated hemorrhages. The combination in this patient of febrile anemia, moderate enlargement of the spleen, and a hemorrhagic syndrome suggested the diagnoses of cryptoleukosis, aplastic myelosis, and hemorrhagic aleukia (aplastic anemia). Blood studies showed impoverishment of the 3 blood elements, i. e., isochromic anemia (red blood cells, 1,840,000 per cubic millimeter), leukopenia, and neutropenia, and an absence of platelets. Cold autoantibodies were also demonstrated. The diagnosis of leukosis was eliminated by the myelographic picture, which was practically normal, revealing an abundance of myeloid cells that contrasted strangely with the peripheral pancytopenia. The discrepancy between the findings in the peripheral blood and the appearance of the bone marrow suggested the existence of hypersplenism, and the reduction of formed elements in all 3 blood lines completed the picture of primary splenic pancytopenia, as described by Doan and Wright.

Repeated transfusions, associated with vitamin K, vitamin B_{12}, iron given intravenously, and hormone therapy, failed to produce any lasting improvement, and the patient's condition grew steadily worse until at last splenectomy seemed to be the only means by which her life could be saved. The red blood cell count at this time was 1,580,000 per cubic millimeter and the leukocyte count was 9,600 per cubic millimeter. Energetic measures were taken, with the help of the Blood Transfusion Center, to improve this picture and to prepare the patient for the strain of operation. Transfusions of concentrated plasma increased the number of red blood cells per cubic millimeter to 4,250,000 by the end of 10 days, although the leukocytes numbered only 2,800 and the platelet level fell to 0. The operation was performed 5 days later and was followed by immediate cessation of hemorrhage and a rapid increase in the levels of platelets and the red and white blood cells. The patient left the service in excellent condition about a month after the operation: her skin and mucosa were normal in color; her temperature was 37 C (98.6 F); and she had already started to gain weight. Follow-up 3 months and 8 months later showed that the cure was apparently permanent and that she had every indication of perfect health, both clinically and biologically, although a few autoantibodies had reappeared in the blood.

An anatomicopathological study of the excised spleen revealed only discrete nonspecific lesions of a congestive character, without hemosiderotic overloading or fibrosis. Findings such as these obtained in this case are rare: they bring up the problem of the complex physiopathological mechanism governing the interaction of the spleen and the bone marrow, concerning which much uncertainty still exists. The theoretical aspects of this problem, however, interesting as they are, are eclipsed in practical importance for the clinician by its therapeutic implications. Primary splenic pancytopenia is one of the best indications for splenectomy, and this procedure should be resorted to without hesitation, even in apparently hopeless cases, if hormone therapy has been tried and proved unsuccessful.

Value of Laparoscopy in Ascitic Syndromes Presenting Diagnostic Difficulties. M. Girard and M. Coulot. Semaine hôp. Paris 34:2109-2115 (Sept. 4-12) 1958 (In French) [Paris].

Laparoscopy can now be more widely used because of the modern technical advances which have made the present-day laparoscope a highly developed and only slightly traumatizing instrument. Most French publications describe its value as a diagnostic procedure in conditions affecting the liver and gallbladder, especially jaundice, but this report is concerned with its use in patients with ascitic syndromes. The optical system of the laparoscope, unlike that of the cystoscope, is not designed for looking through liquids, particularly not ascitic fluid, which is rarely clear and transparent. The first requirement, then, is to evacuate the fluid and to dry the peritoneal cavity as completely as possible. This may be difficult, and, if it cannot be accomplished, the projected examination of the abdominal organs may become impossible. The second step is the creation of a pneumoperitoneum through the trocar used in evacuating the ascites. Anesthesia is then induced, plane by plane, with particular attention to the deep peritoneal plane. The small incision needed for the introduction of the trocar and the laparoscope is made with a bistoury at a site determined by the clinical conditions. The transmuscular route is preferable, provided that the course of the epigastric artery is respected, to the median aponeurotic route, which favors the development of postoperative ascitic fistulas. The Fourès laparoscope (diameter, 0.5 cm.), used by the authors, requires only a slight aperture in the muscle, which can easily be closed after the examination with 1 or 2 clips. A drop of collodion over the puncture-insufflation opening completes the operation, which is entirely benign and can be repeated 2 or even 3 times in the same patient.

The diagnostic value of this procedure was amply demonstrated in 32 patients with ascites studied by the authors, who summarize its advantages as follows: 1. Laparoscopy has a threefold importance in the diagnosis of hepatic sclerosis. First, it may show that the sclerosis is due to some cause other than alcoholism, e. g., by revealing the characteristic appearance of the hemosiderotic liver or of the macronodular liver of postviral sclerosis, or, as in one of the authors' patients, the presence of constrictive perihepatitis. Second, the general view of the liver parenchyma obtained by laparoscopy usually provides a better indication of the prognosis than any other clinical or histological guide. Third, laparoscopy alone makes it possible to deny, confirm, or reveal the existence of associated lesions, especially cancer or tuberculosis. 2. Laparoscopy alone in patients with ascites of tumoral origin but no perceptible tumor makes it possible to identify the true cause of the clinical picture (visceral cancer with or without peritoneal extension, primary or especially secondary cancer of the liver, or genital tumors in women). 3. Laparoscopy, supplemented when necessary by biopsy, is invaluable in establishing a diagnosis of peritoneal tuberculosis, sometimes showing the point of origin to be in the adnexa and indicating the type of treatment needed, whether medical or surgical.

Kidney Transplantation Between Seven Pairs of Identical Twins. J. E. Murray, J. P. Merrill and J. H. Harrison. Ann. Surg. 148:343-359 (Sept.) 1958 [Philadelphia].

The total experience with kidney transplantation at the Peter Bent Brigham Hospital in Boston is reviewed. In 16 of the 23 operations the donors were unrelated, and in none of these the transplanted kidney survived permanently. Fifteen pairs of monozygotic twins were observed as potential candidates for renal transplantation, and 7 received transplants from their identical twins. Four of these patients had chronic glomerulonephritis, 1 had subacute glomerulonephritis, and 2 had chronic pyelonephritis secondary to calculus disease and megaloureters respectively. Eight patients did not receive transplants; 3 of these died prior to treatment and testing, 4 still responded to standard therapy, and 1 refused to be considered.

The histories of the 7 patients in whom transplantation was performed are presented. Indications for the transplantation are that the healthy potential donor must have evidence of normal renal function bilaterally, be free from infection, have a normal lower urinary tract, and have sufficient understanding of the significance of a unilateral nephrectomy. The recipient must be in a terminal state of irreversible uremia and have a normally functioning lower urinary tract. The operative technique consists of 2 simultaneous operations, the nephrectomy and the transplantation, being started in 2 adjacent operating rooms. The nephrectomy on a healthy donor requires careful dissection of the vasculature to obtain maximum length of the renal artery and vein. The transplantation is accomplished with the patient under continuous spinal anesthesia. The recipient site is prepared in the right lower quadrant retroperitoneally, exposing the iliac vessels from the bifurcation of the aorta to the inguinal ligament. All the terminal branches of the hypogastric artery are dissected, care being taken to preserve each branch for possible use if renal anomalies are encountered in the donor. The renal artery is anastomosed end-to-end to the hypogastric and the renal vein end-to-side to the external iliac vein. If 2 or 3 renal arteries are present, suitable branches of the hypogastric are selected. The ureter is passed through a muscular tunnel and sutured to the bladder mucosa. The time lapse from clamping of blood supply in the donor to its restoration in the recipient has been 55 to 75 minutes.

Six of the 7 patients obtained return of normal function clinically, chemically, and by x-ray. One of these patients died 4 months after transplantation when the transplanted kidney became involved with the original disease. One other, still living, had signs and symptoms suggestive of active disease in the transplant. Four others are living and well, the longest 3½ years after transplantation. One recipient successfully completed a normal pregnancy a year and a half after transplantation.

NEUROLOGY & PSYCHIATRY

Papillary Carcinoma of the Choroid Plexus. J. Ribe Portugal and E. Geiger. J. Brasil. neurol. 9:91-111 (Jan.-Dec.) 1957 (In Portuguese) [Rio de Janeiro].

Tumors of the choroid plexus are extremely rare in children. As a rule, they are malignant. The treatment consists of surgical removal of the tumor and of roentgenotherapy. The surgical prognosis is poor. Recurrences are frequent and occur shortly after the operation in a high percentage of cases. The authors report the case of a child, 6 years old, who was hospitalized at the Hospital of the Instituto de Neurologia of the University of Brazil with an illness of 2 months' duration. The patient complained of frontal headache and vomiting. On hospitalization he was semicomatous and showed clinical and roentgenologic signs of intracranial hypertension, cerebellar symptoms, and sporadic clonic movements of the hands. The ventriculograms showed a tumor deeply located in the region of the left lateral ventricle. At operation the tumor was found in this ventricle, infiltrating and perforating the cerebral cortex at its middle line and spreading over the lamina quadrigemina and the superior cerebellar peduncles. After the tumor had been completely removed, histological examination showed it to be a papillary carcinoma. The patient did well after the operation and was discharged in satisfactory condition 2 months afterward.

According to the literature on tumors of the choroid plexus in children, these tumors have been located in the lateral ventricles in 32 of the 42 cases reported. The left lateral ventricle was more frequently involved than the right. Of the 42 cases, the tumor was found at autopsy in 24; 8 patients died postoperatively, and 10 recovered from the operation. One of the patients who recovered was a 6-year-old child. He is well and without any signs of recurrence 4 years after the operation. This case from the literature is similar to the one reported by the authors.

The Diagnosis and Treatment of Non-Traumatic Cerebrovascular "Accidents": With Special Emphasis on Intracranial Hemorrhage and the "Common Stroke." M. Scott. Pennsylvania M. J. 61:1190-1197 (Sept.) 1958 [Harrisburg].

Cerebrovascular accidents are fourth among the causes of all deaths (170,000 cerebrovascular deaths in 1952), and many more persons are partially or totally disabled by such accidents. The author defines a stroke as a symptom-complex that is most frequently caused by cerebral hemorrhage, thrombosis, embolism, or a brain tumor. The treatment depends upon the differential diagnosis, which can be reached by the following studies: careful history; physical and neurological examination; examination of the eyegrounds and perimetric fields; examination of the spinal fluid for pressure, color of fluid, cell count, quantitative protein, and Wassermann reaction; x-rays of the skull for evidence of shift of the pineal gland; and finally, after careful deliberation, cerebral angiography to decide between intracranial hemorrhage, vascular occlusion, and a brain tumor. Many persons with strokes due to small cerebral hemorrhages or thrombosed vessels recover spontaneously. The intramuscular administration of papaverine hydrochloride in doses of 100 to 200 mg. 4 times a day or the inhalation of 5 or 10% carbon dioxide in 95 or 90% oxygen is preferred treatment for cerebrovascular occlusion or embolism. The use of anticoagulants for suspected thrombosis can cause harm if hemorrhage is confused with thrombosis. Bleeding must be ruled out by a careful history, absence of hemorrhage in the eyegrounds and spinal fluid, and normal position of the pineal gland. The same precautions apply to the use of anticoagulants in cerebral embolism, but here they seem indicated.

The value of stellate block is uncertain. It should be done within 12 hours after the stroke by one skilled in its use and should be repeated 3 or 4 times at 12-to-24-hour intervals. Patients with cerebral aneurysm causing intracranial hemorrhage can be helped sometimes by ligation of the common or internal carotid artery in the neck or intracranial clipping of the aneurysm. Occasionally, patients with massive hemorrhages of the brain can be helped by prompt surgery with evacuation of the clot. The treatment should include therapy of the paralyzed extremity, treatment of speech defects, and management of the individual as a whole for ambulation and livable life.

GYNECOLOGY & OBSTETRICS

Myocardial Failure in Toxemia of Pregnancy. P. N. Siliquini and G. Garbagni. Minerva ginec. 10:531-535 (July 31) 1958 (In Italian) [Turin, Italy].

The correlation between electrocardiograms and tissue oxygen utilization tests was studied in 53 patients with toxemia of pregnancy during the last trimester of pregnancy. The concurrent symptoms of the toxemia of pregnancy were edema, albuminuria, and hypertension. The degree of severity of the disorder was rated on the basis of deficiency in tissue oxygen utilization. Toxemia of pregnancy was rated as mild if the values of the tissue oxygen utilization test varied between 20 and 16%. In this group there were 23 women with a systolic pressure of 160 to 195 mm. Hg and a diastolic pressure of 90 to 105 mm. Hg. Electrocardiographic patterns did not change significantly during this moderate phase, as compared with those recorded before and after the clinical manifestation of the disease. Only a slightly increased cardiac frequency and moderate signs of a greater load on the left ventricle were observed. Toxemia of pregnancy entered a more severe phase when the values of the tissue oxygen utilization test varied between 15 and 11%. This condition was found in 18 patients with a systolic pressure of 150 to over 200 mm. Hg and a diastolic pressure of 95 to 135 mm. Hg. Electrocardiographic patterns showed changes due to the state of pregnancy or to the arterial hypertension in 11 patients. Myocardial failure characterized by smoothing of the 5T segment and flattening of the T wave in all leads was observed in the electrocardiograms of 7 patients.

Toxemia of pregnancy was rated as very severe if the values of the tissue oxygen utilization test varied between 10 and 8%. These values were found in 12 patients, in whom a high degree of edema, albuminuria, and hypertension was observed. The systolic pressure of these patients ranged from 175 to 230 mm. Hg, and the diastolic pressure from 105 to 145 mm. Hg. Ten patients had episodes of eclampsia. Electrocardiographic patterns revealed the presence of diffuse myocardial failure during the acute phase of the disorder in 8 patients; they showed normalcy when the symptoms of toxemia subsided. Decompensation of the left ventricle was established in 3 patients. Since there was no evidence of heart disease in their past history, the decompensation was interpreted to be a manifestation of myocardial failure in toxemia of pregnancy. The decreased tissue oxygen utilization seemed to have been the main pathogenic factor of myocardial failure in this series of patients.

Uterine Carcinoma of Gartner Duct Origin. J. J. Andujar and F. E. Council. Texas J. Med. 54:658-662 (Sept.) 1958 [Austin].

The authors report on 2 women, aged 20 and 25 years, with carcinoma of the uterus originating from Gartner's duct remnants in the organ. Both patients had a persistent vaginal discharge, and both were sterile. A large biopsy specimen was obtained from the younger patient, and a diagnosis of granuloma of the histiocytic type was made. Although the complete lack of mucin and the large, foamy, pinkish cells with an occasional cart-wheel appearance should have given a clue as to the nature of the lesion, an effort was made to cauterize the lesion on the right lip of the uterine cervix, and the patient refused further treatment. She died 8 months after the biopsy was performed, and autopsy was refused. Hysterectomy was performed on the second patient. The surgical specimen showed that the tumor occupied most of the cervix and endocervix and that it seemed to merge with the contiguous musculature of the uterus. Microscopic examination revealed large cells of a rather pinkish color, with round or polyhedral edges. The nuclei were pale and slightly vesicular. In occasional rare fields one could see a cart-wheel pattern. There was no mucin elaborated. No evidence of metastasis was observed 3 years after the surgical intervention.

Gartner's duct remnants in the uterus may give rise to neoplasms. There is a wide difference in the reported incidence of such remnants. Of 1,716 uteri removed by complete hysterectomy and examined by the authors in an attempt to determine the incidence of these remnants by step sectioning the cervix and its vaginal portion horizontally at intervals of a few millimeters, reasonably characteristic Gartner's duct remnants were found in only 36, an incidence of almost 2%. A deceptive microscopic pattern and a lack of awareness of carcinoma of the uterus originating from Gartner's duct remnants may lead to an erroneous diagnosis. The benign appearance of the carcinoma was belied by its fatal course in the first patient. It is possible that the second patient was cured as a result of early removal of the uterus with tubes and ovaries, but survival for 3 years does not warrant a cure. Most of the patients whose cases were collected from the literature later had metastases and died despite the innocent appearance of the histological pattern of the tumor. This type of carcinoma of the uterus deserves far more attention and consideration from clinicians and pathologists in order to classify and combat it effectively and accurately.

Endocrine Relationships between Chronic Cystic Mastitis and Cancer of the Breast. N. A. Womack. Am. Surgeon 24:618-629 (Sept.) 1958 [Baltimore].

This report is based on an extensive review of the literature and on observations made in the department of surgery, University of North Carolina School of Medicine, and the North Carolina Memorial Hospital at Chapel Hill. The hormones having the greatest effect on breast structure are the estrogens, progesterone, and the lactogenic principle from the hypophysis, prolactin. In the breast these hormones work both synergistically and antagonistically. The numerous breast lesions that have come to be referred to as chronic cystic mastitis all represent variants of a single group of histological changes, e. g., duct growth as evidenced by epithelial hyperplasia, duct branching and increase in diameter, acinar atrophy, and periductal edema and fibrosis. At times there may be secretion within the duct; at times there is also round-cell infiltration. The dominant lesion, however, remains within the duct. Thus, it can be seen that chronic cystic mastitis has little to do with inflammation and frequently is not related to cysts. The term "chronic cystic mastitis," however, has reached such a fixed state in medical nomenclature that the author does not attempt to change it. Chronic cystic mastitis develops when a factor of initial susceptibility is followed by a period of long and constant uninterrupted estrogenic action Chronic cystic mastitis is a conditioned proces when not associated with permanent epithelia change. It is thus reversible, and this reversion ca be brought about by the withdrawal of estroge or the administration of an estrogen antagonist Progesterone in adequate dosage seems to be a effective antagonist.

At the author's clinic progesterone in oil wa used in treating 15 patients with chronic cysti mastitis. Pure progesterone in oil was given intra muscularly in 50-mg. doses, beginning about weeks after the start of the previous menstrua period and on alternate days until the next perio began. The use of progesterone in oil, because i necessitated several injections each month an was expensive, was not satisfactory. Neither wa long-acting testosterone which, while an effectiv antiestrogen, possessed undesirable side-effect More recently at the author's hospital hydroxypro gesterone caproate (Delalutin) has been used. Thi progesterone ester is given as a single intramuscula injection of 250 mg. The results obtained with it i 41 patients are tabulated. After 3 or 4 successiv monthly injections treatment is stopped, and th patient is examined at intervals of 3 months. I cysts recur, a new cycle of treatment is begun. Al treatment can usually be stopped after the meno pause. Most patients treated with either hydroxy progesterone caproate or progesterone in oil re sponded favorably to 3 or less monthly injection the premenstrual breast pain and the nipple dis charge being relieved. These observations, alon with the fact that the cysts did not refill unde therapy, suggest an effect on duct secretion. It i also of interest that 17 of the 56 patients treate had had previous surgical excision of the cystic disease before beginning hormone therapy.

The promoting factor for chronic cystic mastitis, namely, estrogen, also promotes the progression of breast cancer. If the initiating factor for the latter happens also to be present in a patient with chronic cystic mastitis, progression into cancer may occur. Statistical evidence suggests that women with chronic cystic mastitis stand a greater chance to develop breast cancer than do women without it. When cancer of the breast occurs, the withdrawal of sources of endogenous estrogens or the administration of antagonists, such as androgens, will be effective only to the extent to which the cancer cells are reversible.

PEDIATRICS

Ulcer Disease in Children. C. C. Hatfield. Virginia M. Month. 85:561-564 (Oct.) 1958 [Richmond].

The author presents the histories of 2 girls, aged 9 and 13 years, and of 2 boys, aged 14 and 17 years, who had a variety of abdominal symptoms and in whom investigation revealed duodenal ulcer. The children were observed in the course of less than

13 months. The 9-year-old girl exhibited typical ulcer symptoms, and the author feels that had she been 20 instead of 9, a diagnosis would have been made at the first office visit. The 13-year-old girl offered a more difficult problem since her symptoms were vague; she resembled the adult patient, with mild epigastric distress and vomiting without definite physical findings. The 17-year-old boy had an almost classical picture except for absence of relief by food; his symptoms were all referable to his gastric retention. The 14-year-old boy had typical ulcer symptoms for 2 years, with retention being the outstanding cause of complaint.

Ulcer disease in children presumably runs the same course as in adults. There is pain, hypermotility, gastric retention, food relief, flatulence, nausea, and vomiting. In the children of this series fluoroscopic examination proved of greater value in identifying the site than did the conventional plates. The use of a spot-film device aids in capturing the involved area at critical moments. It is well to remember that ulcer disease may appear at any age. Symptoms and signs are the same in children as in adults. Response to treatment is excellent. If the physician is aware of the possibility of ulcer disease in children and keeps it in mind, he will be able to diagnose the condition in many of these patients earlier and rehabilitate them more quickly.

The Incidence of True, Chromatin-Positive Klinefelter's Syndrome and Its Relationship to Feeblemindedness. A Prader, J. Schneider. W. Züblin and others. Schweiz. med. Wchnschr. 88:917-920 (Sept. 20) 1958 (In German) [Basel, Switzerland].

The authors determined the nuclear pattern of sex in 336 boys, between the ages of 7 and 15 years, with mild feeblemindedness who attended special classes of the city school in Zürich, Switzerland, and in 390 boys with a high degree of intelligence who attended various high schools in eastern and central Switzerland and served as controls. Of the 336 boys in whom the nuclear pattern was determined with the aid of buccal smears, 8 were found to be chromatin-positive, i. e., their nuclear pattern was of the female sex but they were phenotypic males. The nuclear pattern of the leukocytes was also female in these 8 boys. These findings were sufficient for the diagnosis of true Klinefelter's syndrome. There was no doubt as to the correctness of this diagnosis, since the 2 oldest of the 8 boys had already reached puberty and showed the classic triad of this syndrome, namely, small testes, gynecomastia, and increased excretion of gonadotropin in the urine. Not a single one of the 390 high-school boys with high intelligence was found to be chromatin-positive.

The incidence of true Klinefelter's syndrome was estimated by other workers to be 1 in 10,000. In contrast to this estimated incidence, the authors' findings suggest an incidence of 1 in 42 in males with mild mental deficiency and of at least 1 in 1,000 in the entire male population, i. e., an incidence 10 times higher than the estimated one. The authors' findings prove that the previously observed frequent occurrence of mild feeblemindedness in patients with true Klinefelter's syndrome is not an accidental one. It justifies the routine determination of the nuclear pattern of sex in all mentally deficient males. Due to the fact that 6 of the 8 boys had not yet reached puberty, it was possible to study for the first time the somatic, electroencephalographic, and psychopathological aspects of the true Klinefelter's syndrome in childhood. Similar to the observations made in adult patients with this syndrome, 2 types of body build were seen in the prepuberal patients, namely, the type with inconspicuous proportions of the body and that with definitely eunuchoid proportions. The psychopathological aspect of mild feeblemindedness, mental infantilism, and passive personality was quite similar to that observed, as a rule, in adult patients. A marked psychoendocrine syndrome which was reported frequently in adult patients was apparently absent in the prepuberal patients. Abnormal electroencephalographic recordings were obtained from 4 of the 6 prepuberal patients.

Influence of Adrenal Cortical Hormones on the Course of Miliary Tuberculosis. A. Nitschke. Deutsche med. Wchnschr. 83:1593-1595 (Sept. 12) 1958 (In German) [Stuttgart, Germany].

Earlier observations had revealed that glucocorticoids, such as cortisone, exert a favorable influence on tuberculous meningitis in childhood in that the sugar and chloride contents of the cerebrospinal fluid, which otherwise are reduced for periods of many weeks and which under the influence of tuberculostatic drugs increase only gradually, are elevated to a normal range within a few days after cortisone is given as an adjuvant. The increase in the sugar content of the cerebrospinal fluid can serve as a guide not only for the size of the cortisone dosage but also for the period cortisone treatment has to be continued so that the normalized sugar level will not decrease again.

The author used cortisone or prednisone in treating 9 children with miliary tuberculosis, of whom 4 had miliary tuberculosis without meningitis. It was found that the drugs had to be given over long periods and in large amounts. Doses of 3 mg. of prednisone per kilogram of body weight per day caused regression of the miliary foci in the lungs within an average of 20 days after the onset of treatment, so that they were no longer visible on roentgenoscopy. At the same time, the general condition, the fever, and the sedimentation rate of the erythrocytes were favorably influenced. Comparable series of children treated earlier only with streptomycin and isoniazid showed a similar regression of lesions much later, generally after more than 3 months. In children in whom meningitis complicated the miliary tuberculosis, the meningitis usually subsided simultaneously with the miliary lesions, as was indicated by the sugar and chloride values of the cerebrospinal fluid. In children with miliary nodules in the eyegrounds (retinal involvement), the signs of acute inflammation rapidly regressed, leaving minute scars. The acceleration of the healing processes was so striking that the use of corticosteroids as adjuvants is recommended, provided that proper precautions are taken.

Pulmonary Atelectasis in Bronchial Asthma in Children. J. Luhr. Nord. med. 60:1198-1199 (Aug. 21) 1958 (In Norwegian) [Stockholm].

Pulmonary atelectasis refers to roentgenographically demonstrable collapse of larger or smaller parts of one or both lungs. It is a relatively frequent complication in bronchial asthma in children. Roentgenograms of the lungs of 217 children with bronchial asthma who were treated in the Children's Clinic of the Rikshospital in 1951-1956 showed atelectasis in 12 children, most of them under 10 years of age. It was localized in one lobe, usually the middle lobe of the right lung. Roentgenologic clarification occurred after from 12 to 77 days. Three patients had relapses which persisted for 6, 19, and 106 days respectively. True allergy was seen in 7 patients; bacterial allergy, in 5. Atelectasis may occur in symptom-free periods but occurs more often during asthma attacks. It is ascribed to occlusion of one or more bronchi because of abundant, thick, tenacious secretion, edema of the bronchial mucous membrane, and spasm of the bronchial musculature. The prognosis seems to be good. Bronchoscopy with aspiration of secretion, and possibly the administration of antibiotics to prevent a secondary infection, may be necessary if the atelectasis does not recede quickly.

THERAPEUTICS

A New Superior Oral Diuretic Drug, Chlorothiazide (Diuril): Clinical Evaluation. G. R. Herrmann, M. R. Hejtmancik, R. N. Graham and R. C. Marburger. Texas J. Med. 54:639-644 (Sept.) 1958 [Austin].

Fifty hospitalized patients with congestive heart failure and other diseases involving edematous and hypertensive states were treated with chlorothiazide (Diuril), a sulfamyl benzothiazide compound. The patients were on a low-salt diet (100 mg. per day), and most of them received 45 mEq. of potassium per day. At first, 250 mg. of chlorothiazide was given orally 1, 2, 3, or 4 times a day, and then the dose was gradually doubled for a total of 1 to 2 Gm. per day. The average 24-hour dose in these 50 patients was 750 mg. because of the low dosage used at the beginning of the therapeutic trial. At present 1.5 to 2 Gm. per day is given, and no toxic reaction has occurred, except for a mild rash in patients, diarrhea in 1 patient (which may hav been incidental), and hypopotassemia in 2 patients

Chlorothiazide given orally in doses of 1 to 2 Gm daily practically always initiated a diuresis withi 1 or 2 hours, to reach a maximum at 4 hours and t continue for another 12 to 24 hours. The averag duration of therapy in this group of patients wa 14½ days, with a maximum of 66 days and a minimum of 2 days. The urinary output before the institution of treatment with chlorothiazide average 1,120 cc. per day, as compared with an average output of 1,725 cc. per day after the administration the drug. The loss of weight in these patients ove the average 14½ days of treatment was 15½ lb. (7 kg.). The output of the urinary electrolytes was quadrupled freqently in the first few days of chlorothiazide therapy. It then was maintained at doubled values for 5 to 7 days and remained elevated as long as the urine flow was increased. The patients in congestive failure excreted on the average 28.75 Gm. of sodium, 35.03 Gm. of potassium, and 29.5 Gm. of chlorides for the diuretic period averaging 14 days. The potassium output was unduly high as a result of the routine loading of potassium chloride.

Chlorothiazide thus proved to be highly effective in the treatment of edema. It is ideal for long-term therapy in patients with congestive heart failure except for those on a low-sodium diet and for those with hypertension, nephrosis, and cirrhosis. It may produce low serum potassium levels, and it seems desirable to administer 4 Gm. of supplementary potassium chloride daily, especially if digitalization or steroid administration is carried out. Chlorothiazide is particularly effective in patients with hypertensive atheromatous coronary ischemic heart disease associated with edema, and the drug is superior to all other diuretics, including organic mercurial preparations given by the parenteral route. Chlorothiazide is the drug of choice in eclampsia and in edema of pregnancy. Chlorothiazide appears to be the safest, most effective, and most practical diuretic that has been added to the armamentarium since mercaptomerin (Thiomerin) was introduced.

Experiences with Chlotride, an Orally Administered Nonmercurial Diuretic Used for Treatment of Cardiac Edema. R. Richterich. Schweiz. med. Wchnschr. 88:906-910 and 931-934 (Sept. 13 and 20) 1958 (In German) [Basel, Switzerland].

Chlotride is the Swiss trade name for chlorothiazide (Diuril). This new diuretic sulfonamide with mercurial-like action is administered orally and enhances particularly the sodium and chloride excretion without producing any change in the excretion of bicarbonate in the urine. Often a slight increase in the urinary excretion of potassium may be observed. Three women and 2 men, between the ages of 54 and 81 years, with acute congestive heart failure and extensive edema, 2 of whom were resistant to mercurial diuretics and acetazolamide (Diamox), were given orally 1 Gm. of chlorothiazide per day. Good diuretic results were obtained in all the patients. Undesirable side-effects were observed in only one patient who vomited once on several days; this patient also had a mild degree of hypochloremic alkalosis and showed signs of overdosage of digitalis (bigeminy) which disappeared spontaneously within 24 hours.

Thirteen additional patients with chronic decompensation of the right heart received alternately for 8 to 12 days 3 Gm. of ammonium chloride daily combined with 1 cc. of mercaptomerin (Thiomerin) once a week, and 500 mg. of chlorothiazide given twice a day. The diuretic effect obtained by these 2 methods of treatment was about the same, but resistance to chlorothiazide did not develop and chlorothiazide did not cause any side-effects. At present chlorothiazide is considered the diuretic of choice for the treatment of cardiac edema, because it can be administered orally, its diuretic action is satisfactory, and undesirable side-effects occur only rarely.

Clinical Experiences with the Anticoagulant Warfarin Sodium ("Coumadin Sodium").

R. R. Porter, D. Richardson and H. Page Mauck Jr. Virginia M. Month. 85:465-471 (Sept.) 1958 [Richmond].

The authors report a study on 80 patients with various thromboembolic disorders who have been treated with warfarin (Coumadin) sodium during the last 2 years at the McGuire Veterans Administration Hospital and the Medical College of Virginia Hospital in Richmond. The initial "priming" dose of Coumadin varied from 25 to 75 mg. as a single dose and from 50 to 100 mg. as a double dose administered orally, and from 50 to 60 mg. as a single dose administered intravenously. The sensitivity of patients to Coumadin varies from individual to individual, but it is fairly constant in the same patient. It would appear that a standard dose of 50 to 60 mg. will be suitable in the vast majority of patients weighing between 60 and 80 kg. (133 and 177 lb.) and having initial prothrombin activities of from 60 to 100%. If the patient is unusually heavy or obese, the dose can be increased to 75 mg. The dose should be reduced for patients weighing less than 60 kg. if the initial prothrombin time is 50% or less and if heparin in significant amounts (more than 300 mg. intramuscularly or 150 mg. intravenously daily) is given concomitantly to achieve some measure of anticoagulation during the latent period, i. e., from the time of administration of Coumadin and the onset of therapeutic effects.

The fairly rapid and consistant hypoprothrombinemic effect of Coumadin as measured by the Quick one-stage method confirms the findings as previously reported by other authors. After the initial latent period of from 12 to 18 hours, there is a rapid decline in prothrombin activity, with therapeutic levels attained in 24 to 36 hours after administration. Within the dose range of 50 to 75 mg. there was little difference in the achievement of a therapeutic effect in this 24-to-36-hour period, regardless of the patients' weight. After initial and prompt anticoagulation effect with Coumadin, maintenance therapy can be instituted. The response to the initial dose will be an indication of the patients' sensitivity to Coumadin and will serve as a guide for subsequent maintenance therapy. After 2 or 3 days of adjustment a smooth maintenance is usually achieved on relatively constant dosage, depending on the therapeutic response. Small daily doses achieve smoother control than intermittent larger doses. Coumadin is free of toxic side-reactions, the only adverse effects being its pharmacological action leading to excessive hypoprothrombinemia from overdosage. This latter is readily counteracted by the administration of a single dose of 50 mg. of vitamin K_1. Coumadin appears to be superior to all other hypoprothrombinemia-inducing agents currently available and seems to be the drug of choice for anticoagulant therapy in thromboembolic disorders.

Treatment of Intermittent Claudication with Vitamin E.

P. D. Livingstone and C. Jones. Lancet 2:602-604 (Sept. 20) 1958 [London].

The authors report on 40 nondiabetic male patients with obliterative vascular disease who complained of intermittent claudication. Symptoms had been present for at least 5 years, and in all the patients the pain was felt in the calf muscles. Twenty of the 40 patients were treated with vitamin E and 20 were given placebos. The average age of the patients who received vitamin E was 55.9 years and that of the control group, 57 years. There were 3 patients, aged 40 to 50 years, in each group. A full general examination, with particular attention to the lower limbs, was carried out. Bilateral femoral arteriography showed pronounced arteriosclerotic changes and occlusion. Exercise tolerance tests were performed by climbing up and down a series of 2 steps, 18 in. high, until pain made the patient stop. The results of these tests were evaluated by the patients' own assessment and by the improvement in the average number of circuits (climbing up and down the steps) in the course of the treatment. Treatment was discontinued in 3 patients of each group. Four of the 17 patients who remained in the group treated with vitamin E did not respond at all to treatment. The remaining 13 patients showed much improvement; 7 were able to continue walking indefinitely at a slightly slower pace than usual, 4 were able to walk any distance of up to half a mile and do their full work, and 2 showed slight, but definite, improvement judged by the increase in the number of circuits and steps, and the patients were quite certain that they were more active than they had been and that the pain was less severe. Two of the patients in the control group recovered sufficiently to walk a useful distance. One of these, for no apparent reason, made a complete recovery after suffering from severe claudication for many years. All the other patients in this group derived no appreciable symptomatic relief. Six months after the end of the trial, none of the treated patients, who had improved, had deteriorated; and 3 patients in the control group, who had been transferred to vitamin E therapy at the end of the trial, reported some improvement.

Observations on Peroral Therapy for Diabetes. E. Ikkala and W. J. Kaipainen. Ann. med. int. Fenniae 47:63-73 (No. 2) 1958 (In English) [Helsinki].

Peroral therapy was adopted at the end of 1955 in the outpatient department of the University of Helsinki for 22% of the 675 patients with diabetes who attended the clinic regularly. Peroral treatment with BZ 55 (Alentin) or D 860 (Diabuton) was given to 147 diabetics. In selecting patients for this therapy, mostly older obese diabetics were chosen. The treatment was not given to juvenile diabetics, to patients using large quantities of insulin or those receiving this drug for more than 10 years, and to patients predisposed to ketonuria. Of the 147 diabetics, 27% were fresh cases (no dietary or insulin therapy for more than a month), 43% had been earlier on dietary therapy, and 30% had been earlier on insulin therapy. Seventy-nine per cent of the perorally treated group were women. More than half of the cases were followed up for over a year.

A distinctly better blood sugar equilibrium was generally established with the peroral drugs in the group of fresh cases (40 patients) and in the 63 patients earlier on dietary therapy. Of 459 insulin-treated patients under observation, a switch to peroral therapy was made in the case of 61; in 44 patients the peroral drugs could be substituted for insulin, but in 9 (some of these did not meet the requirements for selection) they were ineffective, and in 8 they were withdrawn for other reasons. Insulin therapy was thus replaced by peroral therapy in 9.6% of the cases.

A weight gain, especially among diabetics earlier on dietary therapy, was observed in spite of a warning to the patients that they should follow previously issued dietary instructions. Of 33 patients who were started on peroral therapy but had to discontinue it, 6 were clearly outside the category for selection; the therapy was considered unnecessary for another 6 patients and was discontinued for 10 at their own request, although no detrimental side-effects were demonstrable. The peroral therapy had to be terminated because of ineffectiveness in 8 patients, who had shown all indications for successful treatment, and in 3 because of allergic reactions to BZ 55. Ineffectiveness of the peroral treatment usually became evident within a month of experimentation.

Effect of Chlorothiazide on Renal Electrolyte Excretion. U. V. Lassen and O. Munck. Ugesk. læger 120:1112-1115 (Aug. 21) 1958 (In Danish) [Copenhagen].

A single dose of chlorothiazide administered to normal persons was followed by greatly increased secretion of sodium and chloride ions and some increase in bicarbonate and ammoniac excretion The creatinin clearance was not affected. If chlorothiazide is given intermittently on good indication electrolyte disturbance will rarely occur, at al events not in persons on a normal diet. Overdosage of chlorothiazide caused metabolic acidosis, hypokalemia, and hypochloremia.

Chlorothiazide Treatment of 10 Patients with Edema. C. Michelsen. Ugesk. læger 120:1118-1121 (Aug. 21) 1958 (In Danish) [Copenhagen].

The results of chlorothiazide treatment in 11 patients with edema are discussed. Daily examinations of the serum and urine for values of potassium, sodium, bicarbonate, and chloride, determinations of the pH and pCO_2 of the blood, and diuresis were carried out; there was also regular control of the urine for protein, of serum uric acid and creatinin values, and of blood pressure and weight. In one patient treatment had to be discontinued because of hypokalemia. In 3 patients the treatment was without effect. The remaining 7 patients showed increased diuresis and increased excretion in the urine of sodium, potassium, and bicarbonate. In about half of the patients there was a tendency to a low serum potassium level. No essential shiftings in the acid-base conditions were seen in any case. Two patients were treated with chlorothiazide for a longer time.

Local Treatment of Bronchial Asthma with Hydrocortisone Powder. H. Herxheimer, M. K. McAllen and D. A. Williams. Brit. M. J. 2:762-765 (Sept. 27) 1958 [London].

The authors report on 79 patients with chronic bronchial asthma who were treated by inhaling a capsule of micronized hydrocortisone snuff from a powder inhaler. A capsule, containing 15 mg. of hydrocortisone and 85 mg. of lactose, was placed in this inhaler; half of the contents were inhaled in the morning and half in the evening. Forty-five of the 79 patients served as their own controls; a few of the 45 were given hydrocortisone snuff for

2 weeks, followed by a similar period during which hydrocortisone snuff was not given; in most of the 45 patients the hydrocortisone snuff period was followed or preceded by an equal period of placebo snuff. A definite improvement in symptoms occurred in 33 of the 45 patients. This improvement was observed mainly in patients with a history of allergy and in those without hypersecretion. Improvement was seen to a much less extent in patients with the infective type of asthma than in those with the allergic type. Patients with "dry" asthma, i. e., those who never expectorated any mucus except during rare and short periods of upper respiratory infection, responded dramatically. These findings show that the result of topical treatment in any group of patients with asthma will mainly depend on the type of asthma involved. The hope that the topical treatment of bronchial asthma might replace steroid systemic therapy in most cases and might thus avoid the dangers of continuously given large systemic maintenance doses has not materialized; only a minority of patients appear to be benefited by corticoids given topically.

Bronchial Asthma and Chronic Bronchitis Treated with Hydrocortisone Acetate Inhalations. W. H. Helm and F. Heyworth. Brit. M. J. 2:765-768 (Sept. 27) 1958 [London].

Twenty-five male and 28 female patients, between the ages of 15 and 61 years, with asthma or wheezy bronchitis of at least one year's duration, whose condition had been severe enough to necessitate periods off work, were hospitalized and treated with antibiotics and routine antispasmodic drugs before receiving hydrocortisone inhalations. The patients inhaled fine hydrocortisone acetate powder from a "pabracort" inhaler, the powder being in capsules containing 15 mg. of hydrocortisone acetate and 75 mg. of lactose powder, both being ground fine to a mean particle size of 5 μ. The initial dose varied between 1 capsule 3 times a day and 1 capsule daily, given as half a capsule twice daily, according to the severity of the wheezing at the beginning of treatment. The dose was reduced to the minimum maintenance necessary as soon as improvement occurred. The usual maintenance dose was half a capsule twice daily. Treatment was stopped in patients with recurrent asthma, once the attack had been relieved for a week, and they were provided with capsules and instructed to restart at the onset of symptoms in a dose of between 1 and 3 capsules daily according to the severity of the attack. Patients who had failed to make any definite improvement during 2 weeks' treatment with inhalations were assessed as failures, and the treatment was stopped.

Of the 53 patients, 43 (81%) improved on hydrocortisone inhalations, whereas 10 (19%) were not improved. Of the 43 patients who improved, 13 (30%) relapsed after periods of 1 to 11 months, whereas 30 (70%) maintained the improvement for periods varying between 2 months and 2 years. Best results were obtained in patients with recurrent acute asthma without significant bronchial infection, whereas the results in patients with wheezy bronchitis were disappointing. There were no definite complications, but one man had mild dyspepsia for a few weeks, which may have been due to the hydrocortisone. Several patients put on weight, which was probably due partly to improved health and partly to the effects of hydrocortisone absorption.

The inhalations of fine-particle hydrocortisone acetate powder thus were found to be an effective form of treatment in many patients with bronchial asthma. There is a strong tendency to relapse if the treatment has to be maintained, but prolonged benefit may continue if the inhalations can be used intermittently for recurrent attacks of asthma. Although the treatment may be successful in status asthmaticus, it is probably less effective in this condition than intravenous or oral administration of corticosteroid drugs, and its use is not recommended if the patient is dangerously ill. A considerable portion of the "inhaled" hydrocortisone is probably absorbed, but the dosage is low compared with that used in oral therapy with a corticosteroid, and the chance of toxic effect is, therefore, much less. The optimum dosage is uncertain, but it probably varies from patient to patient. Little or no benefit is likely to be obtained from this form of treatment in patients with established chronic bronchitis.

Inhalation of Hydrocortisone Acetate for Bronchial Asthma: A Short-Term Controlled Trial. W. H. Helm and F. Heyworth. Brit. M. J. 2:768-769 (Sept. 27) 1958 [London].

A short-term controlled trial of inhalations of hydrocortisone acetate in fine-particle powder was carried out by the "double-blind" method during 38 trial periods in 14 men and 12 women with bronchial asthma of at least one year's duration. Of the 26 patients, 17 were treated by inhalations of hydrocortisone powder; 14 of these were improved, and 3 were not improved. Of the remaining 9 patients treated by inhalations of a placebo powder, 3 were improved and 6 were not improved. Thus, the number of patients improved in the hydrocortisone-treated group as compared with the placebo-treated group was at a statistically significant level. Hydrocortisone powder inhalations, therefore, are an effective form of short-term treatment in some patients with bronchial asthma.

Nature and Treatment of Septic Shock. W. A. Altemeier and W. R. Cole. A. M. A. Arch. Surg. 77:498-507 (Oct.) 1958 [Chicago].

The survival of 16 patients in a series of 41 with septic shock is indicative of the effectiveness of the basic principles of treatment which have been evolved. The importance of treatment and an early recognition of septic shock cannot be overemphasized. Delay in diagnosis and failure to recognize the septic cause of the circulatory collapse when the process becomes terminal or irreversible are chief factors responsible for failure of therapy. Early diagnosis and treatment will be facilitated if the significance of the characteristic sharp curves of rising temperature, pulse rate, and white blood cell count and the coincident inverted curve of falling arterial pressure and urinary excretion are kept in mind. The fact that only 25% of these patients demonstrated any evidence of hemoconcentration has supported the belief that large amounts of fluid replacement are not indicated and that they may be harmful in producing pulmonary edema if used in a vain effort to restore the blood pressure.

The intravenous infusion of arterenol in 5% dextrose in water has appeared to be particularly useful when regulated to maintain a systolic blood pressure above 80 mm. Hg and a urinary output of 25 cc. or more per hour. By this method it has been possible to maintain urinary function until the infection has been brought under control and to permit survival of the kidneys. Arterenol was administered for periods up to 144 hours to 15 of the 16 patients who survived. It was infused through indwelling polyethylene tubing, thus preventing local cutaneous gangrene. Large doses of intravenously administered antibiotics seemed efficacious in controlling the infection, but 2 to 7 or more days were required for this effect. This delay emphasized the importance of adequate supportive treatment to extend life until the antibiotic effect could be obtained. When arterenol was found to be inadequate, hydrocortisone in doses up to 100 mg. was given to 3 patients; without it, it is doubtful whether any of these patients would have survived. Eleven of the 16 surviving patients received blood or plasma or both, the amounts varying from 500 to 4,500 cc. Thirteen patients were given oxygen therapy over periods of 24 to 168 hours. It is generally better to treat patients with a severe uncontrolled infection conservatively, but surgical intervention may be necessary in those manifesting sudden vascular collapse. It takes critical judgment to determine which patients with septic shock require operation and the time when this is feasible.

PATHOLOGY

Failure to Prove Identity of Tumor Cells in the Peripheral Blood. F. W. Taylor and F. Vellios. Surgery 44:453-456 (Sept.) 1958 [St. Louis].

The concept that there may be occasional showers of cancer cells in the peripheral blood of cancer patients is not new, and interest in this problem was revived by a monograph published by Engell in 1955. The authors felt that one means of definitely establishing the identity of such cells would be to reinject the suspected cells in the hope of producing a metastasis. Four patients were studied who were in the terminal phase of neoplastic disease. All had carcinoma (of lung, stomach, or colon) with widespread extension; "tumor cells" were demonstrated in the peripheral blood of each. The patients died at intervals of 2 to 7 months after the investigation.

In carrying out the investigation, blood was drawn from the antecubital vein into a heparin solution or was taken from the femoral artery. The blood was then spun for 15 minutes at 1,500 rpm so that a buffy coat could be isolated. This layer was mixed with a small quantity of isotonic sodium chloride solution to make approximately 2 ml. This mixture contained most of the suspicious abnormal cells present in a 50-to-80-ml. sample of the patient's peripheral blood. Twelve such samples were withdrawn from the 4 patients. The buffy coat mixture was reinjected into the patient from whom the sample was taken, usually into a marked area of subcutaneous fat or muscle, but on some occasions it was given intradermally as well. The injection resulted in a local lump, which was observed to diminish in size until no palpable nodule was present 2 months after injection. After death the tissues at the injection site showed little or no gross abnormality. Under microscopic examination there were a little fibrosis, hemosiderin, foreign-body giant cells, and occasionally nuclear fragments. There was, however, never any evidence of tumor cells at the site of injection. No secondary tumor growth resulted.

The authors feel that this failure to reproduce tumor growth from suspected tumor cells in the peripheral blood stream neither proves nor disproves them to be circulating cancer cells. Reasons suggested why these cells might not reproduce a secondary lesion include that the number injected was probably comparatively small and that they were injected with huge numbers of leukocytes. As this mass of leukocytes undergoes degeneration, various ferments are liberated which are highly detrimental and lytic to all cell protoplasm. The tumor cells might well be lysed as a result. Furthermore, the host must have the ability to eliminate stray tumor cells, for otherwise metastases would be unlimited. The elected sites of injection (skin, subcutaneous fat, and muscle) may not have been ideal.

What happens to all these circulating "tumor cells"? The authors never identified or recognized any cells being phagocytized or undergoing degenerative changes. They believe these must be cancer cells, but the final proof is lacking.

"Insulitis" in Early Juvenile Diabetes. P. M. LeCompte. A. M. A. Arch. Path. 66:450-457 (Oct.) 1958 [Chicago].

The author reports on 2 infants, a boy and a girl, aged 11 months, a 9½-year-old boy, and a 17-year-old boy with diabetes mellitus who died within a short time after onset. Autopsy was performed on the 4 patients, and cellular infiltration, usually lymphocytic, of the islands of Langerhans was observed on microscopic examination of the pancreas in all of them. Some of the features of this rare but possibly significant lesion, described previously by other workers, were observed again, such as the variable appearance of the islands (of 2 islands of Langerhans in one patient, one appeared to be essentially normal, while the other showed lymphocytic infiltration); the narrow ribbon-like cords of cells with scanty cytoplasm and darkly stained nuclei, which are apparently alpha-cells and which probably are a manifestation of injury rather than of effective regeneration; the often peripheral distribution of the lymphocytes; and the occasional early fibrosis of an island. Hydropic change, the classical lesion of acute diabetes of recent onset, was seen in only 1 of the 4 patients but was also uncommon in the previously reported cases of "insulitis."

Cellular infiltration, usually lymphocytic, of the islands of Langerhans is observed most often in diabetes mellitus of acute onset and short duration in children. Its apparent rarity may be due in part to the fact that such acute cases come to autopsy only under exceptional circumstances. This "insulitis" may in a few instances be a response to actual invasion of the islands by an infectious agent, although this has not been demonstrated. It is more likely the aftermath of an injury which may differ from the injuries involved in the commonly recognized forms of experimental diabetes. It is probable that this injury in some way inhibits the regeneration of beta-cells.

Histochemical Proof of Organic Phosphate Poisoning. C. S. Petty, A. M. A. Arch. Path. 66:458-463 (Oct.) 1958 [Chicago].

The author reports a case of fatal organic phosphate poisoning in a 23-year-old man who on the morning of illness and death had been cleaning an airplane which had been used 5 days previously for crop dusting with Systox, an insecticide concentrate containing 26.2% of O,O-diethyl-O-2-ethyl mercaptoethyl thiophosphate (Demeton), 2.3% related organic phosphates, and petroleum distillate. Since all organic phosphates combine more or less irreversibly with the cholinesterases of the body, the red blood cell cholinesterase activity was studied during the acute phase of the illness and on autopsy, and the enzyme activity at the myoneurol junction in skeletal muscle was studied on autopsy. The abnormally low antemortem red blood cell cholinesterase level indicated poisoning by one of the organic phosphates. The low postmortem red blood cell cholinesterase level, together with the results of the histochemical staining of the intercostal muscle which did not provide evidence of cholinesterase activity, gave proof of fatal poisoning due to exposure to toxic organic phosphates. In vitro studies with human muscle and both in vitro and in vivo studies with rat muscle showed that Systox is capable of depressing the cholinesterase level at motor end-plates.

Whipple's Disease—Observation on Systemic Involvement: I. Cytologic Observations. J. C. Sieracki. A. M. A. Arch. Path. 66:464-467 (Oct.) 1958 [Chicago].

The author carried out cytological studies on autopsy specimens, including small intestine, mesenteric, axillary, inguinal, and peripheral lymph nodes, and various other tissues and organs, obtained from 7 patients who died of intestinal lipodystrophy (Whipple's disease). A widespread involvement of the tissues of all these patients was observed with cells which contained characteristic sickle-form, periodic acid-Schiff (P. A. S.)-positive cytoplasmic particles. These particles were found in mesothelial cells of the pleural, peritoneal, pericardial, and synovial lining cells. Their presence in a cell block of peritoneal fluid suggested the possibility of entertaining the diagnosis of Whipple's disease from such material. Smears stained according to Papanicolau technique left the characteristic particles unstained and showed the positive P. A. S. reaction when subsequently stained appropriately. Furthermore, the positive particles were diastase-resistant. In smears and imprints stained by the Romanovsky method, numerous vacuolated histiocytes were found. The nuclei of all histiocytes were similar in appearance. One group of these macrophages were the usual type of lipid-containing histiocyte "foam cells," with predominantly uniform-sized cytoplasmic vacuoles; another type, in which the apparent "vacuoles" were less distinct, varied in size and gave the cytoplasm a "moth-eaten" appearance. When these cytological preparations were subjected to the periodic acid-Schiff technique, these 2 varieties of histiocytes were again apparent. The histiocytes without lipid generally contained varying numbers of the sickle-form, positive-reacting particles. Less frequently, cells with uniform-sized vacuoles (foam cells) showed one or more positive sickle-form particles. This was particularly prominent in those preparations containing giant cells. The presence in the peripheral lymph nodes of cells with the characteristic cytoplasmic particle allows the diagnosis of Whipple's disease to be made during life without recourse to laparotomy.

Cerebral Mucormycosis: Report of a Case. M. E. Smith, D. K. Burnham and M. B. Black. A. M. A. Arch. Path. 66:468-473 (Oct.) 1958 [Chicago].

The authors report on a 38-year-old man with diabetes mellitus of 14 years' duration, who was admitted to hospital in coma. History showed that one week before admission he had sinusitis, with stuffiness in the nose and fever. At no time in his life had he had diabetic coma, and, although he was deeply comatose on admission, he did not have acidosis. There were marked proptosis of the right eye and edema of the right lid. He had difficulty in urinating. A clinical diagnosis of labile diabetes, subacute glomerulonephritis, and cavernous sinus thrombosis was made, and the patient received antibiotic therapy, intravenous fluids, and artificial respiration. He died 36 hours after admission.

Gross findings on autopsy consisted of hypertrophy of the heart, moderate coronary artery sclerosis, and edematous brain, with almost the entire right temporal lobe being replaced by clotted blood; a second hemorrhagic zone was near the midline of the cerebellar medulla on the right, extending into the upper pons. Both internal carotid arteries and the superior sagittal and right lateral venous sinuses contained thrombi. The cavernous sinuses also contained thrombus material. Microscopic examination revealed that both carotid arteries contained unorganized thrombus attached to the intima and tangled masses of broad branching nonseptate hyphae; the cavernous sinus contained small masses of thrombus and fungal hyphae, both free and invading nerves and fibrous fasciculi in the lumen. The walls of the cavernous sinus showed acute inflammatory reaction and hyphae. Hyphae were also observed in the submucosa of the sphenoid air sinus. An acute meningitis was confined to the area of the optic chiasm. A few hyphae lay inertly in the midbrain parenchyma above the chiasm, unassociated with inflammation. One bronchus was the site of an acute necrotizing ulcerating inflammation containing numerous hyphae. Other findings included advanced diabetic glomerulosclerosis, marked renal arteriosclerosis, bilateral chronic pyelonephritis, and multiple thromboses of small pulmonary arteries.

The true nature of the patient's disease was not discovered until the microscopic examination. Cultures for fungi were not made during life or at autopsy. The ethmoid sinuses and orbits were not investigated at autopsy. The evidence indicated that the infection arose in nose and paranasal sinuses and/or orbit and spread to the brain by way of the internal carotid arteries and cavernous sinuses. Proptosis and ophthalmoplegia were characteristic and apparently attributable to direct fungal invasion of the eye and retrobulbar space. In most cases collected from the literature, the mycotic infection was limited to the head. It is likely that in this patient the bronchial involvement was a separate primary focus, since there was clinical evidence of preceding orbital and sinus involvement. Characteristically there was total lack of inflammatory reaction to hyphae in some areas and a marked response in others.

Cerebral mucormycosis is a rare but distinctive entity, usually a rapidly fatal complication of diabetes mellitus. The case of this patient is a classical example. Since the 17 patients in the previously reported cases had rather stereotyped manifestations, more widespread knowledge of this condition should result in more frequent diagnoses during life and more thorough investigation at autopsy. Routine examination of paranasal sinuses in patients with diabetes mellitus coming to autopsy might help elucidate the pathogenesis.

Behavior of Leukocyte Sedimentation Rate in Tuberculous Disease and in Septic Infections. E. Lusvarghi, L. Bellesia and P. Mucci. Minerva med. 49:2735-2737 (July 11) 1958 (In Italian) [Turin, Italy].

Leukocyte sedimentation rates, according to the technique of Storti, were investigated simultaneously in 2 groups of patients. One group consisted of 20 patients with various types of pulmonary tuberculosis. The other group consisted of 10 patients with acute and chronic types of bacterial sepsis. Erythrocyte sedimentation rates were recorded for control purposes. Leukocyte sedimentation rates were determined before and several times during the treatment until the clinical cure of the disease. In patients with pulmonary tuberculosis and with bacterial sepsis the latter rates were above normal values. There was a close correlation between the leukocyte sedimentation rates and the Katz formula levels at the onset or at the termination of the disease. The leukocyte sedimentation rates were elevated and the Katz formula levels were within limits only in 1 patient with active bilateral tuberculosis of the apex and in 3 patients with bacterial sepsis. An increased level of fibrinogen seemed to be responsible for an elevated leukocyte sedimentation rate, whereas qualitative and quantitative changes in albumin and globulin values apparently had no bearing on it. Increased leukocyte sedimentation rates in patients with pulmonary tuberculosis and with bacterial sepsis indicated a probable direct participation of the leukocytes in the defense of the organism. Study of the leukocyte sedimentation rate is a useful diagnostic aid to be used along with the erythrocyte sedimentation rate. It can clarify in differential diagnosis certain roentgenologic findings in the lung and distinguish pulmonary tuberculosis from malignant tumors.

BOOK REVIEWS

Chronic Bronchitis, Emphysema and Cor Pulmonale. By C. H. Stuart-Harris, M.D., F.R.C.P., Sir George Franklin Professor of Medicine of University of Sheffield, Sheffield, and T. Hanley, M.D., M.R.C.P., Lecturer in Medicine of University of Sheffield. Written in collaboration with Marjorie Clifton, M.D., Research Assistant to M.R.C. Group for Epidemiological Research on Respiratory Diseases, London, Margaret M. Platts, M.D., B.Sc., M.R.C.P., J. D. S. Hammond, M.B., Ch.B., M.R.C.P., and W. Whitaker, M.D., M.R.C.P. Cloth. $8.50. Pp. 245, with 61 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; John Wright & Sons, Ltd., 42-44, Triangle West, Bristol 8, England, 1957.

The authors are to be commended on their choice of subject. Chronic bronchitis and emphysema are ubiquitous and imply serious consequences which more than justify bringing recent data to the attention of the medical profession. Each chapter carries worthwhile material. The authors recognize the smallness of the number of patients observed, which may detract somewhat from the weight of evidence presented. Even so, their focus on the salient features of these diseases, objectivity in observation, and sound logic in interpretation render the text of great value. The sincere dedication and praiseworthy thoroughness of the authors is impressive. Their preferential definition of chronic bronchitis is serviceable although it may not coincide with the concepts of other experts in this field. The clinical findings of chronic bronchitis are portrayed in an excellent manner. Various objective signs and findings on physical and x-ray examination are presented briefly but competently. The fallibility of some of the physical findings is well emphasized. The relation of infection to chronic bronchitis and emphysema is discussed concisely but adequately. Pathological and clinical aspects of emphysema are well described, although it is difficult to condone the omission of one of the cardinal pathological substrates of this disease, namely, destructive changes in the elastic elements of the lung.

There is a fine, practical section on pulmonary function studies. Nearly 60 pages deal with chronic cor pulmonale. Its incidence, clinical characteristics, and pathological physiology are skillfully covered. Current knowledge of pulmonary arterial blood pressure, cardiac output, oxygen-carrying capacity of the blood, and other related facets of the subject are assayed in lucid, easily readable fashion. The chapter on treatment is logical and methodical. Emphasis on the use of bronchospasmolytic drugs deserves special credit. Also commendable is the authors' cautious attitude toward the administration of narcotics as cough sedatives, and to use of oxygen for the relief of dyspnea. At the same time, their dogmatic negativism is hardly justifiable concerning artificial pneumoperitoneum and the surgical treatment of emphysema. The chapter on the epidemiology and pathogenesis of chronic bronchitis is written with critical analysis and is solidly documented. It contains tables and graphs that facilitate clear comprehension of the subject matter. The roentgenograms and photographs of gross specimens and histological preparations are of high quality. The case reports are of great didactic value. The references at the end of each chapter are well selected and up to date, and the index covers all essential items. Blank pages at the end of the book invite pertinent notes. This volume is likely to become a favorite with all those interested in diseases of the chest.

Bacterial and Mycotic Infections of Man. Edited by René J. Dubos, Ph.D. Aided by grant from National Foundation. Third edition. Cloth. $8.50. Pp. 820, with 116 illustrations. J. B. Lippincott Company, E. Washington Sq., Philadelphia 5; 4865 Western Ave., Montreal 6, Canada; Pitman Medical Publishing Company, Ltd., 45 New Oxford St., London, W. C. 1, England, 1958.

This edition of a classic textbook combines bacteriology with practical clinical application. While the essential format of the previous editions remain the same, the book has been completely rewritten to present changing concepts concerning microbial diseases. A previous criticism of the book, that it lacked continuity, has been vitiated by its reorganization. New chapters include "The Evolution and Ecology of Microbial Diseases" and "Chemotherapy of Microbial Diseases." The first of the new chapters contains many points of view not necessarily shared by other contributors to the text, but these speculative concepts of infection versus disease (why do pathogens so often fail to cause disease after they have become established in the tissues?) provide a broad background to the understanding of disease determinants. Much praise must be given for the valuable material on antigen-antibiotic reactions and anaphylaxis. The chapter on the principles of sterilization should be valuable to every physician and his office staff.

While the general emphasis is on prevention and the potential disease state (host-parasite relationship), there is much information on the principles of chemotherapy as applied to clinical practice, including complete discussions on the individual

---

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

preparations containing giant cells. The presence in the peripheral lymph nodes of cells with the characteristic cytoplasmic particle allows the diagnosis of Whipple's disease to be made during life without recourse to laparotomy.

Cerebral Mucormycosis: Report of a Case. M. E. Smith, D. K. Burnham and M. B. Black. A. M. A. Arch. Path. 66:468-473 (Oct.) 1958 [Chicago].

The authors report on a 38-year-old man with diabetes mellitus of 14 years' duration, who was admitted to hospital in coma. History showed that one week before admission he had sinusitis, with stuffiness in the nose and fever. At no time in his life had he had diabetic coma, and, although he was deeply comatose on admission, he did not have acidosis. There were marked proptosis of the right eye and edema of the right lid. He had difficulty in urinating. A clinical diagnosis of labile diabetes, subacute glomerulonephritis, and cavernous sinus thrombosis was made, and the patient received antibiotic therapy, intravenous fluids, and artificial respiration. He died 36 hours after admission.

Gross findings on autopsy consisted of hypertrophy of the heart, moderate coronary artery sclerosis, and edematous brain, with almost the entire right temporal lobe being replaced by clotted blood; a second hemorrhagic zone was near the midline of the cerebellar medulla on the right, extending into the upper pons. Both internal carotid arteries and the superior sagittal and right lateral venous sinuses contained thrombi. The cavernous sinuses also contained thrombus material. Microscopic examination revealed that both carotid arteries contained unorganized thrombus attached to the intima and tangled masses of broad branching nonseptate hyphae; the cavernous sinus contained small masses of thrombus and fungal hyphae, both free and invading nerves and fibrous fasciculi in the lumen. The walls of the cavernous sinus showed acute inflammatory reaction and hyphae. Hyphae were also observed in the submucosa of the sphenoid air sinus. An acute meningitis was confined to the area of the optic chiasm. A few hyphae lay inertly in the midbrain parenchyma above the chiasm, unassociated with inflammation. One bronchus was the site of an acute necrotizing ulcerating inflammation containing numerous hyphae. Other findings included advanced diabetic glomerulosclerosis, marked renal arteriosclerosis, bilateral chronic pyelonephritis, and multiple thromboses of small pulmonary arteries.

The true nature of the patient's disease was not discovered until the microscopic examination. Cultures for fungi were not made during life or at autopsy. The ethmoid sinuses and orbits were not investigated at autopsy. The evidence indicated that the infection arose in nose and paranasal sinuses and/or orbit and spread to the brain by way of the internal carotid arteries and cavernous sinuses. Proptosis and ophthalmoplegia were characteristic and apparently attributable to direc fungal invasion of the eye and retrobulbar space In most cases collected from the literature, the mycotic infection was limited to the head. It is likely that in this patient the bronchial involvement was a separate primary focus, since there was clinical evidence of preceding orbital and sinus involvement. Characteristically there was total lack of inflammatory reaction to hyphae in some areas and a marked response in others.

Cerebral mucormycosis is a rare but distinctive entity, usually a rapidly fatal complication o diabetes mellitus. The case of this patient is classical example. Since the 17 patients in the previously reported cases had rather stereotyped manifestations, more widespread knowledge of thi condition should result in more frequent diagnose during life and more thorough investigation a autopsy. Routine examination of paranasal sinuses in patients with diabetes mellitus coming to autopsy might help elucidate the pathogenesis.

Behavior of Leukocyte Sedimentation Rate in Tuberculous Disease and in Septic Infections. E. Lusvarghi, L. Bellesia and P. Mucci. Minerva med. 49:2735-2737 (July 11) 1958 (In Italian) [Turin, Italy].

Leukocyte sedimentation rates, according to the technique of Storti, were investigated simultaneously in 2 groups of patients. One group consisted of 20 patients with various types of pulmonary tuberculosis. The other group consisted of 10 patients with acute and chronic types of bacterial sepsis. Erythrocyte sedimentation rates were recorded for control purposes. Leukocyte sedimentation rates were determined before and several times during the treatment until the clinical cure of the disease. In patients with pulmonary tuberculosis and with bacterial sepsis the latter rates were above normal values. There was a close correlation between the leukocyte sedimentation rates and the Katz formula levels at the onset or at the termination of the disease. The leukocyte sedimentation rates were elevated and the Katz formula levels were within limits only in 1 patient with active bilateral tuberculosis of the apex and in 3 patients with bacterial sepsis. An increased level of fibrinogen seemed to be responsible for an elevated leukocyte sedimentation rate, whereas qualitative and quantitative changes in albumin and globulin values apparently had no bearing on it. Increased leukocyte sedimentation rates in patients with pulmonary tuberculosis and with bacterial sepsis indicated a probable direct participation of the leukocytes in the defense of the organism. Study of the leukocyte sedimentation rate is a useful diagnostic aid to be used along with the erythrocyte sedimentation rate. It can clarify in differential diagnosis certain roentgenologic findings in the lung and distinguish pulmonary tuberculosis from malignant tumors.

BOOK REVIEWS

Chronic Bronchitis, Emphysema and Cor Pulmonale. By C. H. Stuart-Harris, M.D., F.R.C.P., Sir George Franklin Professor of Medicine of University of Sheffield, Sheffield, and T. Hanley, M.D., M.R.C.P., Lecturer in Medicine of University of Sheffield. Written in collaboration with Marjorie Clifton, M.D., Research Assistant to M.R.C. Group for Epidemiological Research on Respiratory Diseases, London, Margaret M. Platts, M.D., B.Sc., M.R.C.P., J. D. S. Hammond, M.B., Ch.B., M.R.C.P., and W. Whitaker, M.D., M.R.C.P. Cloth. $8.50. Pp. 245, with 61 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; John Wright & Sons, Ltd., 42-44, Triangle West, Bristol 8, England, 1957.

The authors are to be commended on their choice of subject. Chronic bronchitis and emphysema are ubiquitous and imply serious consequences which more than justify bringing recent data to the attention of the medical profession. Each chapter carries worthwhile material. The authors recognize the smallness of the number of patients observed, which may detract somewhat from the weight of evidence presented. Even so, their focus on the salient features of these diseases, objectivity in observation, and sound logic in interpretation render the text of great value. The sincere dedication and praiseworthy thoroughness of the authors is impressive. Their preferential definition of chronic bronchitis is serviceable although it may not coincide with the concepts of other experts in this field. The clinical findings of chronic bronchitis are portrayed in an excellent manner. Various objective signs and findings on physical and x-ray examination are presented briefly but competently. The fallibility of some of the physical findings is well emphasized. The relation of infection to chronic bronchitis and emphysema is discussed concisely but adequately. Pathological and clinical aspects of emphysema are well described, although it is difficult to condone the omission of one of the cardinal pathological substrates of this disease, namely, destructive changes in the elastic elements of the lung.

There is a fine, practical section on pulmonary function studies. Nearly 60 pages deal with chronic cor pulmonale. Its incidence, clinical characteristics, and pathological physiology are skillfully covered. Current knowledge of pulmonary arterial blood pressure, cardiac output, oxygen-carrying capacity of the blood, and other related facets of the subject are assayed in lucid, easily readable fashion. The chapter on treatment is logical and methodical. Emphasis on the use of bronchospasmolytic drugs deserves special credit. Also commendable is the authors' cautious attitude toward the administration of narcotics as cough sedatives, and to use of oxygen for the relief of dyspnea. At the same time, their dogmatic negativism is hardly justifiable concerning artificial pneumoperitoneum and the surgical treatment of emphysema. The chapter on the epidemiology and pathogenesis of chronic bronchitis is written with critical analysis and is solidly documented. It contains tables and graphs that facilitate clear comprehension of the subject matter. The roentgenograms and photographs of gross specimens and histological preparations are of high quality. The case reports are of great didactic value. The references at the end of each chapter are well selected and up to date, and the index covers all essential items. Blank pages at the end of the book invite pertinent notes. This volume is likely to become a favorite with all those interested in diseases of the chest.

Bacterial and Mycotic Infections of Man. Edited by René J. Dubos, Ph.D. Aided by grant from National Foundation. Third edition. Cloth. $8.50. Pp. 820, with 116 illustrations. J. B. Lippincott Company, E. Washington Sq., Philadelphia 5; 4865 Western Ave., Montreal 6, Canada; Pitman Medical Publishing Company, Ltd., 45 New Oxford St., London, W. C. 1, England, 1958.

This edition of a classic textbook combines bacteriology with practical clinical application. While the essential format of the previous editions remain the same, the book has been completely rewritten to present changing concepts concerning microbial diseases. A previous criticism of the book, that it lacked continuity, has been vitiated by its reorganization. New chapters include "The Evolution and Ecology of Microbial Diseases" and "Chemotherapy of Microbial Diseases." The first of the new chapters contains many points of view not necessarily shared by other contributors to the text, but these speculative concepts of infection versus disease (why do pathogens so often fail to cause disease after they have become established in the tissues?) provide a broad background to the understanding of disease determinants. Much praise must be given for the valuable material on antigen-antibiotic reactions and anaphylaxis. The chapter on the principles of sterilization should be valuable to every physician and his office staff.

While the general emphasis is on prevention and the potential disease state (host-parasite relationship), there is much information on the principles of chemotherapy as applied to clinical practice, including complete discussions on the individual

---

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

chemotherapeutic agents. Other chapters contain discussions on human blood groups, epidemiology, principles and practice of diagnostic medical bacteriology, and specific pathogenic groups of bacteria and fungi. Because of financial support from the National Foundation, the book sells for a remarkably low price, especially considering the style of presentation (profuse tables, diagrams, and illustrations; excellent type and paper; complete index; and a careful, comprehensive bibliography) along with its content and its authors of exceptional reliability. The book is highly recommended to students and clinicians who deal with infectious disease.

A History of the Department of Internal Medicine, State University of Iowa College of Medicine, 1870-1958. By Walter L. Bierring, M.D. With introduction by William B. Bean, M.D. Cloth. $3.50. Pp. 116, with illustrations. State University of Iowa, Iowa City, 1958.

This little volume is of special interest because it has been prepared by Dr. Walter L. Bierring, whose life span began almost on the birthday of the College of Medicine of the State University of Iowa. It contains an interesting introductory chapter outlining the history of the College of Medicine and a brief one on the history of the department of internal medicine. The main body of the volume, however, is devoted to biographical and autobiographical résumés of the eight persons who have occupied the chair of the department originally called theory and practice of medicine, which today is the department of internal medicine. These brief sketches offer an interesting portrayal of the progress of medicine during this 90-year period. Those concerned with the management and utilization of the modern teaching hospital should find the description of the Rules and Regulations for the Government of the University Hospital in 1898-1899 of particular interest.

Cerebral Vascular Disease: Transactions of the Second Conference Held Under the Auspices of the American Heart Association, Princeton, New Jersey; January 16-18, 1957. Irving S. Wright, chairman. Clark H. Millikan, editor. Including classification and outline of cerebrovascular diseases. Report by ad hoc Committee established by Advisory Council for National Institute of Neurological Diseases and Blindness, Public Health Service. Cloth. $4. Pp. 224. Published for American Heart Association by Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W. C. 1, England, 1958.

This book covers the problems of nomenclature and has, as an appendix, a classification and outline of cerebrovascular diseases prepared by a committee under the chairmanship of Dr. Millikan which should go a long way toward crystallizing thinking in this important area. The rest of the monograph deals with specific aspects of the subject presented by authorities in the field, together with the discussion which followed each presentation. Thus, Drs. R. D. Adams and H. Fang covered the anatomy and pathology of the cerebral blood vessels; Dr. G. Nylin discussed cerebral blood flow and blood pool; Dr. A. C. Corcoran, the interrelation of hypertension and cerebral vascular disease; Dr. J. P. Whisnant, experimental cerebral vascular disorders; Dr. C. M. Fisher, intermittent cerebral ischemia; Dr. J. Stamler, the cause and therapy of atherosclerosis; Dr. E. McDevitt, anticoagulant therapy; Dr. E. Cliffton, experiments on enzymes in treating thrombosis and embolism; Dr. E. H. Botterell, surgery of intracranial aneurysmal hemorrhage; and Dr. P. Lee, rehabilitation. The gaps in our knowledge are stressed. No one interested in cardiovascular diseases can afford to neglect reading this monograph carefully. It should go a long way in bringing to the fore a much neglected aspect of medicine. Dr. I. Wright, who was responsible for this symposium, as well as the first one deserves much praise, as do the persons and agencies who supported it. They and the participants have rendered a great service to the medical profession.

Clinical Endocrinology. By Karl E. Paschkis, M.D., Associate Professor of Medicine, Jefferson Medical College, Philadelphia, Abraham E. Rakoff, M.D., Clinical Professor of Obstetrics and Gynecologic Endocrinology, Jefferson Medical College, and Abraham Cantarow, M.D., Professor of Biochemistry, Jefferson Medical College. Second edition. Cloth. $18. Pp. 941, with 274 illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1958.

This book is divided into sections on the anterior pituitary, posterior pituitary, thyroid, adrenal cortex, adrenal medulla, ovaries, placenta, testes, pancreas, parathyroids, obesity, and methods and materials. The chapters in each section deal with the embryology, anatomy, physiology, and disorders of the various glands. This book reflects the increase in endocrine knowledge since its first edition, particularly in the fields of thyroid and adrenal physiology, pathology, and therapy. The authors have done an extensive and commendable job of revising and, in some instances, rewriting chapters. They discuss in common-sense terms the male climacteric, the existence of which is denied by some authors. The term may be unfortunate, but few experienced observers will deny that some aging men exhibit the clinical findings mentioned by these authors. Their condition is greatly alleviated by the administration of androgens.

This excellent reference book suffers from the faults or weaknesses of all books in this field. There is an overemphasis on the value of laboratory findings and too little value attached to a careful history and physical examination. It also deals primarily with severe, far-advanced, "typical" cases. It is doubtful if this could be otherwise since the diagnosis is doubtful enough, in some instances, even in such cases, but disorders do have a beginning, a mild stage, before they become typical. These are seen not by endocrinologists, as a rule, but by general practitioners, surgeons, and internists. Such patients seldom have the time, means, or inclination to go through with a lot of expensive tests which at best may not be conclusive. Hyperfunction of the pituitary's eosinophilic cells is discussed as acromegaly. Gigantism is merely mentioned and yet in many cases it is preventable. In 1948 in a postgraduate course in endocrinology, irradiation of the pituitary was described as a method of preventing it. This mode had been used for 15 or 20 years at that time, in over 300 patients. The procedure has been in use for at least 25 years. Its discussion here would have been helpful. The authors would have done a great service to the American public and to the medical profession if they had included a chapter pointing out some of the signs and symptoms of endocrine disorders that could be elicited by a careful history and physical examination. Too often private practitioners are, by circumstances beyond their control, compelled to rely on the history and physical examination plus a therapeutic test. The more help we can give such men—and that means most physicians—the greater service we render the public and the profession. Incidentally, after the most extensive battery of laboratory tests the diagnosis can, in some cases, be settled only by a therapeutic test. This book should nonetheless be a valuable addition to any physician's library.

Congenital Anomalies of the Hand and Their Surgical Treatment. By Arthur Joseph Barsky, M.D., D.D.S., Professor of Clinical Surgery, Albert Einstein College of Medicine, New York City. Publication number 311, American Lecture Series, monograph in Bannerstone Division of American Lecture in Orthopaedic Surgery. Edited by Charles Weer Goff, M.D., Associate Clinical Professor of Orthopaedic Surgery, Yale University School of Medicine, New Haven, Conn. Cloth. $5.75. Pp. 165, with 77 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This excellent monograph is amply illustrated with roentgenograms and photographs of all deformities. Of particular value are the line drawings indicating the location of skin incisions in the operative repair of web fingers, floating thumb, lobster-claw hand, and other deformities. The work is based on a large personal series of 165 cases. It is well organized and has excellent chapters on incidence, cause, and various genetic, environmental, chemical, and endocrine factors. The effect of irradiation is briefly discussed, but, above all, the author has emphasized that heredity plays the greatest role in handing down defects to the germ plasm of the embryo. The bibliography is extensive and should be of great value. Credit is given to earlier authors for their pioneer work. The monograph is highly technical. It is a necessity in the library of the plastic surgeon and the orthopedist, but it is a little above the level of the medical student and the resident. To them it should be valuable as a reference book.

The Planning of International Meetings. Handbook issued by Council for International Organizations of Medical Sciences established under joint auspices of UNESCO and WHO. Paper. $2.50. Pp. 113. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada; published in French by Masson & Cie., 120 boulevard Saint-Germain, Paris 6e, France, 1957.

Those who have attempted to plan international meetings know the problems that can arise when men and women from various parts of the world attempt to meet on a common medical ground. While the spirit and the knowledge may have much in common, procedure can vary tremendously and is often an unnecessary source of irritation, particularly if improper planning is evident. This booklet is an attempt to provide guidance for planning and is worthy of careful study by those who are interested in the planning of such meetings, as well as by those who merely hope to attend but would like to get the most out of such sessions.

Manual of Medical Emergencies. By Stuart C. Cullen, M.D., Professor of Surgery; Chairman, Division of Anesthesiology, State University of Iowa College of Medicine, Iowa City, and E. G. Gross, M.D., Professor and Head of Department of Pharmacology, State University of Iowa College of Medicine. Third edition. Cloth. $5.75. Pp. 302, with 41 illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1958.

This handy pocket-size book provides information without wasted details on many common problems that confront the practitioner. It is not as comprehensive as many textbooks are, but apparently it is not intended to be. Rather, it is to be used for quick reference. In this respect, interns and general practitioners may find it of greater value than others. There may be some forms of treatment, particularly with the newer drugs, that would be found missing, but this is the hazard associated with writing any medical book. Furthermore, there may be a dispute about treatment (such as the recommendation that a snakebite wound should be incised), but such criticisms do not detract from its usefulness.

The Early Diagnosis of the Acute Abdomen. By Sir Zachary Cope, B.A., M.D., M.S. Eleventh edition. Cloth. $4.50. Pp. 188, with illustrations. Oxford University Press, Amen House, Warwick Sq., London, E. C. 4, England; 114 Fifth Ave., New York 11; Amen House, 480 University Ave., Toronto 2, Canada, 1957.

This popular book has gone through sufficient editions to justify its broad acceptance. It is practical, helpful, and easily understood. Unfortunately, there is an appearance of crowding of type on the pages so that it is not easy to read, but for those who desire a ready reference source, to which they can go for a subject or a symptom without attempting to cover a system or the body as a whole, this book should be found practical because of the directness with which the author discusses the problem.

QUESTIONS AND ANSWERS

PREVENTING STAPHYLOCOCCUS INFECTIONS IN THE NURSERY

To the Editor:—*In an attempt to control contamination by staphylococci in a hospital nursery, is there any practical value in obtaining nose and throat cultures on newborn infants at the time of discharge on the third day?*

M.D., South Carolina.

Answer.—Nose and throat cultures taken at the time of the baby's discharge from the hospital on the third day give important evidence in preventing an epidemic in the nursery by detecting carriers. They are also important in controlling an epidemic already present by giving information which would aid in tracing the method of spread of staphylococci in the nursery. This information supplements more important data from nose and throat cultures on asymptomatic mothers, nurses, and other personnel and from cultures from skin, blood, stools, and urine of infants and mothers with clinical evidence of infection. The greatest value of routine nose and throat cultures at the time of discharge would be to the family physician or pediatrician who attends the infant in the home. Such information would enable the physician to administer the appropriate antibiotic to infants with positive cultures before the onset of symptoms. It is important, therefore, that culture reports be immediately available to the family physician or pediatrician, as well as to the house staff.

PTYALISM

To the Editor:—*A 30-year-old man has been suffering from hypersalivation (ptyalism) for about 15 years. No dietary or emotional basis can be found for this annoying condition which fills up his stomach with saliva, causing heaviness in the upper abdomen and nausea. No pathology can be found locally. Anticholinergic drugs, atropine, and local mouth irrigations do not give any degree of improvement. Please advise what can be done for relief.* *M.D., New York.*

Answer.—The hypersalivation would not cause "heaviness in the upper abdomen and nausea." The hourly secretion of "resting" salivary glands equals 15 cc., and the total amount of saliva secreted daily varies from about 600 to about 1,500 cc. or more. It is unlikely that even a substantial amount of hypersalivation would be related to the nausea in this case. On the contrary, nausea itself is a powerful stimulus for the salivary glands and would, therefore, cause hypersalivation. Therefore, a search for the actual cause of the nausea is in order. For example, one should be certain not only that the gastrointestinal series shows normal findings but that a barium enema and gallbladder studies also show normal results. If no organic basis for the nausea can be found, simple abdominal distention with gas may be the explanation and can be treated by the administration of belladonna tincture, 0.6 cc. before meals and at bedtime, and pavatrine, 125 mg. after meals; by the avoidance of iced drinks and cold foods; and by the taking of a hot drink before each meal. The following diet may be of value:

One-half glass of orange juice, diluted with one-half glass of hot water, should be taken on arising. If stools are hard or infrequent, this same amount of orange juice and hot water should be taken before each meal. If stools are loose, the orange juice should be omitted until they are formed. For breakfast, the following foods may be chosen from: Any cooked fruit, fresh, dried, or canned, may be stewed or baked. If canned fruit is used, it should be brought to a boil and cooled before eating. Well-cooked oatmeal or cream of wheat may be used, with puffed wheat and puffed rice during the summer. Bacon should be broiled and eggs soft-boiled, poached, baked soft in a ramekin dish, or scrambled in the top of a double boiler. Toast, preferably melba toast, should be of white bread, with butter spread on as it is eaten. Tea, coffee, or milk may be used (not more than one cup of coffee daily). The noon and evening meals may be chosen from the following list of foods: raw oysters, broth, or creamed soups made from the vegetables which are allowed on the diet; any white fish, such as halibut or haddock, or hot boiled lobster (no mackerel, salmon, clams, or any oily fish; fish should be boiled, broiled, or baked); beef, lamb, chicken, or broiled liver or kidneys; turkey, duck, and partridge (no dressings or gravies; meats may be in any form except boiled or from the frying pan or deep fat); potato, rice, or macaroni once or twice daily; native (garden) lettuce and celery—if possible, twice a day; other vegetables as follows: string beans, asparagus, spinach, carrots, raw carrot sticks, peas, cauliflower, beets, squash, artichokes, eggplant (boiled or broiled, not fried or scalloped),

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

and mushrooms, not sautéed; and desserts as follows: jello, cooked fruit, soft puddings, American, cream, cottage, Gruyère, Port du Salut, or Swiss cheese, and sponge or angel cake. White bread, or very fine graham bread, should be used, preferably cut thin and toasted dry, with butter to be spread on as it is eaten.

REGIONAL ENTERITIS AND ABSORPTION

To the Editor:—*A woman, aged 32, developed ankle edema with some constant and persistent pain in the lower part of the abdomen after delivery of her last child. The abdomen is slightly distended. There are no palpable masses and no tenderness on palpation. Examination of the intestines showed the lower portion of the ileum to be thickened for about 24 in. The diagnosis was regional ileitis. At operation, about 3 ft. of ileum was removed, with some enlarged mesenteric glands. She received about 5 units of serum albumin (low salt) and was advised to be on a high-protein diet. From 1945 until 1956 she had repeated blood protein examinations at about six-month intervals. The serum albumin level has always been low, and 6-10 intravenous injections of serum albumin, 25 mg. units, have been given. She has had persistent diarrhea since the operation. Repeated x-rays of the intestines at about yearly intervals revealed some recurrence of the ileitis. In 1956, she developed ascites, for which repeated taps were done, with recurrence every six days. In June, 1957, she was given 10 units of serum albumin intravenously; all liver function tests gave normal findings, and hematology was the same as in 1945. Exploratory examination of the abdomen revealed some extension of the ileitis. Liver, adnexa, stomach, large intestines, and the rest of the abdominal viscera were normal, and no reason for the recurrent ascites could be found. After six weeks of hospitalization she was discharged with instructions to be on a low-sodium and high-protein diet. Since July, 1957, she has received about 30 units of a serum albumin. She has lost about 20 lb. (9.1 kg.) in weight. She is taking chlorothiazide, 500 mg. three times a day, and is on a sodium-free diet, but the ascites is worse than ever, her appetite is very poor, and diarrhea persists. Urine output is normal. The blood protein level is always low before the serum albumin administration and returns to normal after. At present, she is very weak and hardly able to move about (weight, 102 lb. [46.3 kg.]). Please discuss etiology and treatment.* *David Cohen, M.D., Philadelphia.*

Answer.—The description in this case is that of a rather extensive, advanced regional enteritis, with possibly more involvement than is visible to the naked eye. In some of these patients there is great interference with the processes of absorption. A deficiency state occurs, resembling that resulting from long-standing depletion of protein or withholding of protein. The etiology of regional enteritis is, of course, obscure. The symptom complex described in this patient's case resembles that occasionally seen in a patient with regional enteritis in which the lesions are roentgenographically rather limited yet in which changes throughout much of the small intestine occur. Some of these patients have responded to roentgen therapy (Bargen, J. A. M. A. 165:2045-2047 [Dec. 21] 1957). A high protein intake should be maintained. Edema and ascites may well be associated with lack of protein absorption.

TERTIARY SYPHILIS AND YAWS

To the Editor:—*Is there a definite method of differentiating between tertiary syphilis and tertiary yaws (framboesia)? The modifications of the Wassermann test (Ide's, Kolmer's, and others) and the Treponema pallidum immobilization test both may give positive results in either disease. What is the present treatment of choice in yaws? Has broad-spectrum antibiotic therapy given lasting and irreversible results? In a patient allergic to penicillin, would erythromycin, 500 mg. given every four hours for 30 days, be regarded as satisfactory treatment for tertiary syphilis? What would be recommended as alternative therapy?* *David N. Shapiro, M.D.*
Johannesburg, South Africa.

Answer.—There is no way of differentiating serologically between lesions of tertiary syphilis and yaws. The Treponema pallidum immobilization test has so far revealed no essential immunogenic differences between the treponemes of syphilis and yaws (Grin, *Bull. World Health Organ.* 15:959, 1956). Some clinical differentiations between them are well outlined by Furtado (*A. M. A. Arch. Dermat.* 76:446, 1957). Penicillin is the treatment of choice in yaws. In Haiti, 258 patients with early yaws were "cured" with sterile procaine penicillin G with aluminum stearate suspension. Injections of 1 cc. at 12-hour intervals were given for four days for a total of 2,400,000 Oxford units. Rein stated, "There are no proven instances of either clinical re-infection or relapse in the patients followed for one year" (*Ann. New York Acad. Sc.* 55:1179, 1952).

Benzathine penicillin G, the delayed and long-acting penicillin, may give similar results with 1,400,000 units. Smith and co-workers (*Bull. World Health Organ.* 15:1087, 1956), in a follow-up report after two years of treatment of early syphilis, found that one injection of 2,400,000 units of benzathine penicillin G produced a higher clinical and serologic cure than 4,800,000 units of procaine penicillin G with aluminum stearate suspension given in two to four sessions. Benzathine penicillin G also gave "satisfactory" clinical and serologic results in the late cases of yaws observed by Furtado. The results of treatment of yaws with broad-spectrum antibiotics are inconclusive, but apparently these are not as effective as penicillin.

Ampofo and Findlay (*Tr. Roy. Soc. Trop. Med. & Hyg.* 44:311, 1950) treated six children with secondary yaws with orally given oxytetracycline. They received either three or four capsules twice daily for seven days, for a total of 10.5 to 14 Gm. Dark-field examinations became negative within 24 to 36 hours, and healing of the lesions was complete in one to four days. Three months after the completion of therapy, all had shown a reduction in titer on serologic testing but none attained seronegativity. Oxytetracycline apparently exerts only a bacteriostatic effect, in contrast to the bacteriocidal effect established for penicillin.

Erythromycin, although not used extensively, appears to be as effective in syphilis and yaws as the other antibiotics, such as chlortetracycline and oxytetracycline. Furtado mentions erythromycin as one of the antibiotics which have been proved effective clinically and serologically in the treatment of yaws. Thomas (*J. A. M. A.* 162:1536-1539 [Dec. 22] 1956) and Olansky and Garson (*A. M. A. Arch. Dermat.* 77:476, 1958) found that the broad-spectrum antibiotics given in 1-Gm. doses every six hours for seven days were as effective as penicillin for treatment of early syphilis. In latent and late syphilis, similar doses are given for 15 days and in neurosyphilis for 30 days. Half of that amount may be given in twice the number of days if the patient can not tolerate 4 Gm. of the antibiotic a day. Oxytetracycline is better tolerated than chlortetracycline. From these reports, it is evident that 90 Gm. of erythromycin should be considered adequate treatment unless the patient has neurosyphilis, when 120 Gm. would be required. In latent and late syphilis, neurosyphilis, and late lesions of yaws, only symptomatic and clinical results may be expected with adequate therapy, as mentioned, with no reversal in serologic fastness.

MUSCLE CRAMPS

To the Editor:—*What is the cause and treatment of muscle cramps? Is there any relationship between them and the use of calcium in the form of phosphorus or carbonate?*

M. G. Radewan, M.D., Wenatchee, Wash.

Answer.—Practically anything that interferes with the nutrition and gas-exchange of normally innervated skeletal muscle can cause the painful contractions called cramps. This is illustrated by the fact that cramps are seen in both sodium intoxication and sodium depletion and in both oxygen intoxication (as when divers inhale oxygen under pressure) and intermittent claudication (ischemic pain in peripheral vascular disease). It is generally assumed that the calcium ion has a relaxing effect on skeletal muscle, yet it antagonizes the magnesium ion which likewise has a relaxing effect. The calcium ion antagonizes both the inhibitory effects of potassium and the stimulant effects of sodium. The concentration of calcium in the blood is greatly reduced by intravenous injections of phosphoric acid or sodium phosphate, yet rather large doses of these two substances are necessary in order to induce tetany. These conflicting facts of experiment do not afford a secure basis for preferring phosphate-free compounds of calcium in the treatment of muscle cramps. There are some products on the market which have been promoted for preventing muscular spasms in pregnancy and which contain the calcium in the form of carbonate or lactate. But it remains to be proved that these phosphate-free compounds, as sources of calcium, are better than calcium phosphate. In elderly patients the most common cause of muscular cramps at night is impaired circulation through the muscles, and the logical treatment is active and passive exercise with or without the use of such vasodilator drugs as ethyl alcohol, theobromine sodium acetate, and nylidrin hydrochloride.

REMOVAL OF IMBEDDED TICKS

To the Editor:—*Please advise on suitable methods to prevent dog ticks from becoming attached to the skin while a person is in brush and weeds. Once the pests are imbedded, how should they be removed without leaving the parasite's body in the skin? Is there any effective antipruritic?*

Harold R. Peasley, M.D., Des Moines, Iowa.

Answer.—The best way to prevent tick bites is to avoid heavily infested areas during the spring and summer months. If one must venture into these areas, protective clothing with elastic at the openings and high boots should be worn. The openings of the clothing or the entire garment may be sprayed with tick repellents. One of the best repellents is *N*, *N*-diethyltoluamide, which may be obtained in a concentration of 50% in a liquid or 15% in a spray. The U. S. Army has had considerable success with M-1960, which consists of equal parts of *n*-butylactanilide, 2-butyl-2-ethyl-1,3-propanediol, and benzyl benzoate, with 10% polysorbate 80 as emulsifier (Chandler, Parasitology, ed. 9, New York, John Wiley & Sons, 1955, p. 519). While 10% DDT powder is not effective against all species of ticks, it may afford some protection. The body and clothing should be inspected twice a day, if possible, for ticks. Ticks may be removed by touching them with the end of a lighted cigarette, by coating the tick with fingernail polish or petrolatum, or by grasping the tick with a pair of forceps and twisting the head and mouth parts free. Care should be taken not to crush the tick lest the infectious contents be spilled into the wound. Paint the bite with an antiseptic—iodine tincture is a good one. Antihistamine ointments may produce some antipruritic effects when applied to the bites.

DESENSITIZATION OF RH-NEGATIVE MOTHER

To the Editor:—*About one year ago there was an article concerning a haptene that was being experimentally used to desensitize the Rh-negative mother during pregnancy and the newborn infant. Has this substance been developed further? Is it commercially available, and if so, from whom? Are there any recommended prophylactic measures other than hesperidine and ascorbic acid?*

A. D. Heetderks, M.D., Bozeman, Mont.

Answer.—Many years ago it was shown that the so-called Rh haptene had no specific activity in in vitro tests and that the injection of this material had no effect on the degree of sensitivity of the mother during the pregnancy or on the newborn infant. Hesperidine and ascorbic acid have also been found to be of no real value in such cases, although the use of vitamin C and other vitamins is generally recommended as part of the management of all expectant mothers. In fact, there is no known prophylactic measure of value for treating sensitized expectant Rh-negative mothers. The only treatment of established value is exchange transfusion on the baby, which, of course, can be applied only after the baby is born. For fuller details, the following reference may be consulted: Wiener, "An Rh-Hr Syllabus" (vol. 9, Modern Medical Monographs, New York, Grune & Stratton, Inc., 1954).

CATARACT SURGERY

To the Editor:—*What are the schools of thought pertaining to the indications for removal of a cataract which has not ripened to maturity? Also, would it be advisable to remove an unripened cataract from one eye, with the best corrected visual acuity of 20/200 or less, in a person who is blind in the opposite eye as a result of injury or any surgical procedure for an eye impairment?*

Joseph Bogan, M.D., Hyattsville, Md.

Answer.—In recent years the question of whether or not to operate on a patient with an immature cataract has become nearly academic. The maturity of the lens has no role in the decision concerning cataract surgery with intracapsular lens extraction for the improvement of vision. Nuclear sclerosis and posterior subcapsular cataract rarely progress to maturity, and most surgeons believe that it is not necessary to carry out artificial procedures either to make the remainder of the lens opaque or to delay surgery. The decision concerning the time of operation is usually related to how much the visual defect interferes with the patient's activities. A housewife may be moderately content with 20/200 vision, while a businessman or physician would find it impossible to carry on with this degree of visual reduction. Generally, blindness in the opposite eye is no indication for delaying surgery once the vision impairment interferes with the patient's activities.

COLORING OF SEMINAL FLUID

To the Editor:—*A healthy, 33-year-old married man has a complaint of flecks, which resemble graham cracker crumbs in color and consistency, in his seminal fluid. Physical examination revealed no abnormality of the urogenital tract. The result of a Papanicolaou smear of prostatic secretion was reported as negative. He had been taking two high-potency multivitamin capsules daily. He states that the discoloration ceased when he stopped taking the vitamin capsules. Is there any possible connection between the "flecks" in the seminal fluid and the large amount of multivitamin and mineral ingested?*

L. J. Steffan, M.D., Plymouth, Wis.

Answer.—A thorough search of the recent literature has failed to yield any information relative to the "graham cracker flecks" found in the semen. Normal semen is known to contain lecithin, cholesterol, and phosphorized fat. Whether an increase in these constituents after the ingestion of high-potency multivitamin capsules could produce such bodies cannot be answered. This consultant is aware of many unpublished reports of the coloring of semen by a variety of medicaments, but all of these await confirmation.

ALLERGY TO PENICILLINASE

To the Editor:—*Please furnish information regarding the toxic and allergic reactions induced by the use of penicillinase. What is its value in treating an immediate reaction to penicillin?*

M.D., California.

Answer.—This consultant has heard specifically of at least two reactions to penicillinase; these were in the nature primarily of fever and toxic effects resembling reactions to foreign protein rather than anaphylactic shock. Febrile reactions are also mentioned by Dr. M. C. Zimmerman in his published articles. The major consideration, of course, is that penicillinase is an enzyme, and therefore a protein, and that the likelihood of allergic reactions must be anticipated, possibly on the first administration but more likely after repeated administration in the same individual. Penicillinase does not work fast enough to be of appreciable value in the treatment of immediate reactions to penicillin. It may be of value in delayed reactions.

SEASONAL ALLERGIC RHINITIS

To the Editor:—*Is the incidence of complications increased, decreased, or the same after the treatment of uncomplicated seasonal allergic rhinitis (i. e., no asthma or polyps) with antihistamines alone, as compared to that with hyposensitization? Mothers are not anxious to commit themselves to a protracted schedule of regular visits, especially when the children are fearful of injections. Is there any harm in advising treatment with the antihistamine which gives satisfactory relief and waiting until the child is older and more able to cooperate and understand the reason for frequent injections?*

M.D., New Jersey.

Answer.—Evidence that the use of antihistamines in hay fever diminishes or increases the likelihood of such complications as asthma or polyposis is not conclusive. However, the incidence of asthma in persons sensitive to ragweed pollen is about 35% or 40%, and desensitization is effective in preventing the patient with simple hay fever from developing asthma. Thus, it is not the use of antihistamines but rather the omission of desensitization which is the important issue.

DIABETES AND RETINAL HEMORRHAGE

To the Editor:—*A diabetic patient, taking one tablet of tolbutamide daily, had a retinal hemorrhage. Is it possible that this was caused or precipitated by the drug?* *M.D., New York.*

Answer.—As far as is known, there is no evidence to date to indicate that the taking of tolbutamide would cause or precipitate a retinal hemorrhage. Unfortunately, such hemorrhages occur frequently in patients with diabetes, particularly after 10 or more years' duration of the disease. There is considerable evidence to suggest that retinitis occurs earlier and more severely in patients whose diabetic condition has not been well controlled. Some have raised the question as to whether, over many years of the presence of diabetes, sulfonylurea compounds will protect the patient against vascular complications as well as insulin does. However, the answer to this must await the passage of time.

RECURRENT NIGHT SWEATS

To the Editor:—*In the Oct. 11, 1958, issue of* The Journal, *page 843, is a request for advice concerning night sweats. In one treated patient, propantheline bromide was not effective but methantheline bromide, 100 mg., gave complete control. Before the drugs are used, tests must be done to rule out any infection.*

J. W. Robinson, M.D.
2686 Locksley Pl.
Los Angeles 39.

To the Editor:—*With reference to the Question and Answer on recurrent night sweats, which appeared in* The Journal, *Oct. 11, 1958, page 843, a relatively rare cause was not mentioned. Autopsies were performed on two patients with pheochromocytoma who had essentially identical histories. The symptom complex as described warrants investigation along this line. One patient, a 28-year-old primipara, complained of drenching night sweats to the extent that she would have to change her bedclothes several times each night. This began at the third month of pregnancy and persisted to the time of delivery, which was performed by cesarean section because of preeclampsia. Twelve hours later she went into shock and died. A pheochromocytoma of the left adrenal was found. The second patient was a 40-year-old man who had suffered intermittent severe headaches for 10 years. The diagnosis of pheochromocytoma was considered two years prior to his death. Tests with use of phentolamine at that time gave negative results. He, too, experienced night sweats in the year prior to his death. His death occurred during an acute episode associated with hypertension, marked perspiration, and a shock-like state. Again, autopsy revealed a pheochromocytoma of the left adrenal.*

J. Weinberg, M.D.
3230 W. Franklin Blvd.
Chicago 24.

ISOLATION OF PATIENTS WITH STAPHYLOCOCCUS INFECTION

To the Editor:—*In answer to the question on isolation of patients with staphylococcus infection, which appeared in* The Journal, *Oct. 4, 1958, page 716, the consultant states, "All patients should be masked while they are in the operating room." I believe this should read "All personnel should be masked while they are in the operating room."*

Bruce B. Rolf, M.D.
12300 Wilshire Blvd.
Los Angeles 25.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*This consultant meant that not only the personnel but all patients should be masked while in the operating room. It would be an error to limit it to the personnel, because occasionally a guest doctor, consultant, or medical relative are also privileged in being in the operating room. The statement that "all patients should be masked while they are in the operating room" should be accepted. This leaves no exceptions.*

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Governors Informed of Plans for Conference on Aging . .

Cancer Chemotherapy Program in Full Sway . .

President Approves Forming Science Information Service . .

Emphasis on Science Damaging School Health Programs . .

ALL GOVERNORS INFORMED ABOUT CONFERENCE ON AGING

Secretary Flemming, Department of Health, Eduation, and Welfare, has written all governors, reminding them of the White House Conference on Aging, scheduled for January, 1961, and pointing ut to them that the U. S. is prepared to give states rom $5,000 to $15,000 to help in the project. The money may be used to help finance state and local onferences, which are to precede the Washington meeting, and for travel expense of delegates to the ational session.

HEW Under Secretary Bertha Adkins noted that housands of people, far more than could attend the White House sessions, will be able to take part in tate and local meetings. "There should be as wide participation as possible in these meetings," she aid, "including voluntary organizations, legislators, tate officials responsible for welfare activities, ndividuals, and of course, the aging themselves. "Suppose medical research results in adding several more years to life expectancy. This, we want o happen and are working hard to accomplish but we should not be unprepared for the socioeconomic roblems this would bring. Consider for a moment what might happen in Washington if the Public Health Service through research at the National nstitutes of Health should suddenly find a way to halt all heart disease. Such news would send a thrill f hope and relief around the world. It would also present new problems.

"Estimates of actuaries now would be out of the window. What would happen to the Old-Age and urvivors Insurance system if beneficiaries began drawing benefits for much longer periods than originally estimated? Would increased annuity payments cause private insurance companies to ounder?

"The moral of the story is that in the field of aging we are dealing with millions of people and billions of dollars."

CANCER CHEMOTHERAPY PROGRAM IN FULL SWAY

The board collaborative effort to discover chemical compounds that will be effective and safe in the treatment of cancer is in full-scale operation. Secretary Flemming of the Department of Health, Education, and Welfare describes it as a "massive effort by hospitals, universities, research laboratories, industry, and government."

The program is supported and centrally directed by the Public Health Service through the Cancer Chemotherapy National Service Center at the National Cancer Institute. Initiated by Congress in 1953, the program has been steadily expanded. Mr. Flemming listed the following facts to illustrate the scope and magnitude of the effort:

1. Over 40,000 chemical compounds or other materials are being tested annually on more than a million mice to uncover chemicals with anticancer properties. To date more than 70,000 materials have been put through this initial screening process.
2. Between 400 and 600 materials a year are showing sufficient promise in the initial screenings to be given further intensive analysis and testing, including tests in larger animals. In this phase, which takes about six months to complete, more than 9 out of 10 materials are rejected either as ineffective or too toxic for human use.
3. About 40 or so materials a year, or roughly one out of a thousand of all those originally entering the program, are being approved for clinical trials with human patients in some 150 cooperating hospitals in the U. S.

About 70 materials are now undergoing clinical trials, including some newly developed compounds and some that were already in use. The secretary said the Chemotherapy Service Center this year has let 73 contracts totaling $8,300,000 with universities, research laboratories, and nonindustrial institutions and 19 contracts of $4,500,000 with private industrial firms. They cover most of the testing work and a wide range of other projects, including the synthesis or production of complex new chemical compounds. In addition, 140 grants amounting to $3,800,000 have been made so far this year to support clinical trials with cancer patients. The center's budget for this fiscal year is 23 million dollars.

Mr. Flemming said, "It is important, of course, not to raise premature or false hopes for a drug cure for cancer. So far, none of the drugs being tested has proved to be a cure for cancer. The only existing cures for cancer are through treatment by radiation or surgery. The Surgeon General, however, advises me that some promising new compounds developed in the chemotherapy program are now being tested against a variety of cancers, especially acute leukemia and cancers of the breast and stomach."

(Continued on page 28)

'CARDILATE' sublingual tablets for angina pectoris

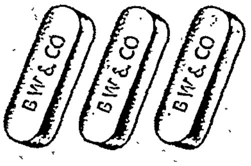
"Nitroglycerin and erythrol tetranitrate when administered sublingually are among the most effective of all prophylactic agents available for the treatment of patients with angina pectoris. The comparatively *prolonged duration of action of erythrol tetranitrate* makes it especially valuable for clinical use."

Riseman, J. E. F., *et al.*: Circulation *17*:22, 1958

'Cardilate' brand Erythrol Tetranitrate
Sublingual Tablets 15 mg., scored.

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, N. Y.

'CARDILATE'



SCIENCE INFORMATION SERVICE APPROVED BY PRESIDENT

A plan designed to help coordinate the grow volume of scientific information published here a abroad, and thus make more of it available to sci tists, has been approved by President Eisenhow

In a report of his Science Advisory Committ headed by James R. Killian Jr., Ph.D., the Natio Science Foundation was directed to expand scientific information program to constitute a s ence information service "that would serve to a and coordinate existing governmental and priva efforts." The White House announcement said t President's action strengthens and reinforces t provision of the National Defense Education A of 1958, which calls for a science information ser ice within the foundation.

The President's committee urged that fullest u be made of existing information services, both pu lic and private, and that the NSF service suppl ment rather than supplant present efforts.

Comments the committee: "The reason scienti information has become a major problem, pa ticularly since World War II, is that the rapid ra of scientific progress has multiplied the volume scientific information to a point where it can longer be published and handled within the fram work of existing methods. When one considers, to that much of what is significant in science is bein published in unfamiliar languages, it is clear th the working scientist is faced with almost insupe able problems in attempting to keep himself in formed on what he needs to know.

"Some idea of the volume of increase may b had from the fact that the science and technolog periodical collections of the Library of Congres have doubled approximately every 20 years for the past century and now contain approximately a mil lion and a half volumes, a significant fraction of the Library's total bound collections. The Library is receiving journals in science and technology at the rate of about 15,000 annually, and 1,200 to 1,500 new periodicals are appearing each year. Yet the library receives less than a third of the 50,000 scien tific periodicals that appear in the world list of 1952, and it is expected that by 1979 the total world output will reach 100,000 journals.

"The language difficulty is reflected in the fac that Russian-language publications are estimated t account for a tenth or more of all the scientific lit erature being published in the world today. Thi Russian total is second only to English."

EMPHASIS ON SCIENCE IS DAMAGING SCHOOL HEALTH PROGRAMS, CONFERENCE TOLD

Growing emphasis on teaching of science an mathematics threatens to wreck school health pro grams, in the opinion of a group of health an recreation leaders gathered in Washington.

The meeting was the Conference on the Physic Fitness of Secondary School Youth, called by th American Association of Health, Physical Educatio and Recreation (AAHPER). Cooperating were number of private and public groups, includin President Eisenhower's Council on Youth Fitnes

"If today's teenagers are to be the nation's space ship operators and rocketmen in the not too distan future, the high schools are going to have to them keep their 'fitness quotients' as high as thei IQ's," AAHPER cautioned.

The health and physical education section of the rence agreed that, since Sputnik, the emphasis been so strongly in the direction of mathe- tics, science, and engineering that the physical cation and health programs have been or will be seriously curtailed.

Paul E. Elicker, executive secretary of the Na- ional Association of Secondary School Principals, nade a strong appeal for improving schools by xtending the school day instead of reducing the resent curriculum to make room for more mathe- natics and science. He said there was a danger to ducation in the proposed four-day work week hat has some popular support. He is convinced that here would be a strong temptation for some par- nts to keep their children out of school the extra lays they are away from the job. The result, Mr. licker feels, would be to drastically shorten the ffective school week.

CUT-OFF DATES FOR DEFENSE EDUCATION FUNDS

Department of Health, Education, and Welfare as set cut-off dates for applications for funds under he National Defense Education Act passed by the ist Congress. The last postmarked date for applica- ons from colleges and universities in the fellow- ip program is Dec. 31, 1958. For the student loan rogram, the last date is Jan. 6, 1959. While no ormal application procedure is contemplated for ie counseling and guidance institutes, schools lanning to propose institutes for the summer of 959 are urged to submit their proposals prior to eb. 1, 1959.

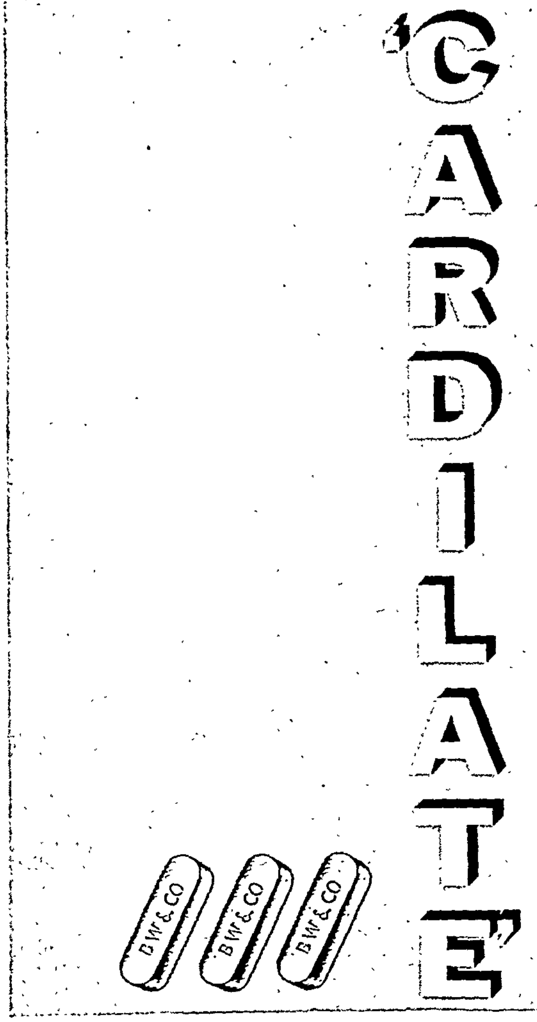
OCDM TO TAKE OVER FUNCTIONS OF COMMITTEE

On Jan. 1, the Office of Civil and Defense Mo- ilization will take over the functions of a presi- ential committee that for more than two years has een carrying on a campaign to identify bright udents and encourage them to study science and ngineering. The group is the President's Committee on Scientists and Engineers. While no physician is on the committee, its leaders have encouraged doctors at the local level to work with other professionals to encourage talented students to continue their educations.

Under OCDM, with E. L. Keenan in charge, the committee will continue with its program. Local action kits and questionnaires will be issued to any doctors or others interested in promoting the committee's efforts.

Doctors who have worked with the committee point out that unless medicine makes an organized effort to channel a fair share of capable students to medical colleges, the practice and teaching of medicine will suffer in the future, when a preponderance of the best students will be in other scientific and engineering careers.

Those familiar with the problem of improving the teaching of science and mathematics in secondary schools feel strongly that there cannot be good instruction in these subjects unless the whole school curriculum is strengthened. They caution that the curriculum should not be overweighted in the science field. Physicians who have been active in the committee's work have, among other things, attempted to insure that biology is not neglected as a major science.



'CARDILATE'
sublingual
tablets for
angina pectoris

Sublingual administration obviates inactivation of nitrites in gastrointestinal tract.

Most closely approximates nitroglycerin in frequency and degree of effectiveness.

'Cardilate' brand Erythrol Tetranitrate
Sublingual Tablets 15 mg., scored.

BURROUGHS WELLCOME & CO. (U. S. A.) INC.
Tuckahoe, N.Y.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. F. J. L. Blasingame, 535 North Dearborn St., Chicago 10, Executive Vice President
1959 Annual Meeting, Atlantic City, June 8-12.
1959 Clinical Meeting, Dallas, Texas, Dec. 1-4.
1960 Annual Meeting, Miami Beach, Fla., June 13-17.
1960 Clinical Meeting, Washington, D. C., Nov. 29-Dec. 2.
1961 Annual Meeting, New York City, June 26-30.
1961 Clinical Meeting, Denver, Nov. 28-Dec. 1.

AMERICAN

1959

January

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS, Palmer House, Chicago, Jan. 24-29. Dr. Clinton L. Compere, 720 N. Michigan Ave., Chicago 11, Secretary.

AMERICAN COLLEGE OF SURGEONS, Sectional Meeting, Francis Marion Hotel, Charleston, S. C., Jan. 19-21. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.

AMERICAN PROTESTANT HOSPITAL ASSOCIATION, Jefferson Hotel, St. Louis, Jan. 27-30. Mr. Leo M. Lyons, 105 W. Adams St., Chicago, Executive Director.

AMERICAN SOCIETY FOR SURGERY OF THE HAND, Palmer House, Chicago, Jan. 23-24. Dr. George S. Phalen, 2020 E. 93d St., Cleveland 6, Secretary.

INTERNATIONAL COLLEGE OF SURGEONS, SOUTHEASTERN REGIONAL MEETING, Miami Beach, Fla., Jan. 4-7. Dr. Harold O. Hallstrand, 7210 Red Road, South Miami, Fla., Chairman.

INTERNATIONAL MEDICAL ASSEMBLY OF SOUTHWEST TEXAS, Gunther Hotel, San Antonio, Tex., Jan. 26-28. Mr. S. E. Cockrell Jr., 202 W. French Pl., San Antonio, Tex., Executive Secretary.

NATIONAL ASSOCIATION OF METHODIST HOSPITALS AND HOMES, Sheraton-Jefferson Hotel, St. Louis, Jan. 27-29. Mr. Olin E. Oeschger, 740 Rush St., Chicago 11, General Secretary.

ROCKY MOUNTAIN TRAUMATIC SURGICAL ASSOCIATION, Aspen, Colo., Jan. 28-31. Dr. Charles B. Bartell, 1600 Orange Ave., Long Beach 13, Calif., Secretary.

WESTERN SOCIETY FOR CLINICAL RESEARCH, Carmel-by-the-Sea, Calif., Jan. 29-31. Dr. William N. Valentine, University of California Medical Center, Los Angeles 24, Secretary.

February

AMERICAN ACADEMY OF ALLERGY, Morrison Hotel, Chicago, Feb. 9-11. Dr. Bram Rose, Royal Victoria Hosp., Montreal, Quebec, Secretary.

AMERICAN ACADEMY OF FORENSIC SCIENCES, Drake Hotel, Chicago, Feb. 26-28. Dr. Walter J. R. Camp, 1853 W. Polk St., Chicago 12, Secretary.

AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE, Boston, Feb. 11-13. Dr. L. Blaney, 1608 Walnut St., Philadelphia 3, Secretary.

AMERICAN COLLEGE OF RADIOLOGY, Drake Hotel, Chicago, Feb. 6-7. Mr. William C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Director.

AMERICAN COLLEGE OF SURGEONS, SECTIONAL MEETING, Shamrock Hilton Hotel, Houston, Texas, Feb. 2-4. Dr. J. Griffin Heard, 6410 Fannin St., Houston 25, Texas, Chairman.

AMERICAN COLLEGE OF SURGEONS, Sectional Meeting, Hotel Vancouver, Vancouver, B. C., Feb. 26-28. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.

AMERICAN OTORHINOLOGIC SOCIETY FOR PLASTIC SURGERY, INC., Del Prado Hotel, Mexico City, Feb. 15-25. Dr. Joseph G. Gilbert, 75 Barberry Lane, Roslyn Heights, N. Y., Executive Secretary.

ASSOCIATION OF CLINICAL SCIENTISTS, Scientific Session, Mobile, Ala., Feb. 27-28. Dr. Earl B. Wert, Mobile Infirmary, Mobile, Ala., Chairman.

CALIFORNIA MEDICAL ASSOCIATION, Sheraton-Palace Hotel, San Francisco, Feb. 22-25. Mr. John Hunton, 450 Sutter St., San Francisco 8, Executive Secretary.

COLORADO STATE MEDICAL SOCIETY, Midwinter Clinical Session, Shirley-Savoy Hotel, Feb. 17-20. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

CONGRESS ON INDUSTRIAL HEALTH, Netherland Hilton Hotel, Cincinnati, Feb. 16-18. Dr. B. Dixon Holland, 535 N. Dearborn St., Chicago 10, Secretary.

MID-SOUTH POSTGRADUATE MEDICAL ASSEMBLY, Hotel Peabody, Memphis, Tenn., Feb. 10-13. Mr. Leslie H. Adams, 774 Adams Ave., Memphis 5, Tenn., Executive Secretary.

SOCIETY OF UNIVERSITY SURGEONS, Denver, Colo., Feb. 12-14. Dr. James D. Hardy, Univ. Medical Center, Jackson, Miss., Secretary.

March

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Baranof Hotel, Juneau, March. Dr. Robert B. Wilkins, 1121 Fourth Ave., Anchorage, Secretary.

AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION, The Homestead, Hot Springs, Va., Mar. 8-9. Dr. F. Johnson Putney, 1712 Locust St., Philadelphia 3, Secretary.

AMERICAN COLLEGE OF ALLERGISTS, Fairmont Hotel, San Francisco, Mar. 15-20. Dr. M. Coleman Harris, 450 Sutter St., San Francisco, Secretary.

AMERICAN COLLEGE OF SURGEONS, Sectional Meeting for Surgeons and Nurses, Kiel Auditorium, St. Louis, Mar. 9-12. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.

AMERICAN LARYNGOLOGICAL ASSOCIATION, The Homestead, Hot Springs, Va., Mar. 8-9. Dr. James H. Maxwell, University Hospital, Ann Arbor, Mich., Secretary.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL & OTOLOGICAL SOCIETY, Homestead, Hot Springs, Va., Mar. 10-12. Dr. C. Stewart Nash, Medical Arts Bldg., Rochester 7, N. Y., Secretary.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, Sheraton-Palace Hotel, S Francisco, Mar. 30-Apr. 1. Dr. Marion F. Langer, 1790 Broadway, Ne York 19, Executive Secretary.

AMERICAN OTOLOGICAL SOCIETY, The Homestead, Hot Springs, Va., Ma 13-14. Dr. Lawrence R. Boies, University Hospital, Minneapolis 1 Secretary.

AMERICAN SOCIETY OF FACIAL PLASTIC SURGERY, New York City, Ma 18. Dr. Samuel M. Bloom, 123 E. 83rd St., New York 28, Secretary

MICHIGAN ACADEMY OF GENERAL PRACTICE, POST-GRADUATE CLIN Sheraton-Cadillac Hotel, Detroit, Mar. 4. Dr. F. P. Rhoades, 970 Maccabees Bldg., Detroit 2, Convention Manager.

NATIONAL HEALTH COUNCIL, Palmer House, Chicago, Mar. 17-19. M Philip E. Ryan, 1790 Broadway, New York 19, Executive Director.

NATIONAL MULTIPLE SCLEROSIS SOCIETY, New York, Mar. 9. Mr. Do Vail, 257 4th Ave., New York 10, Secretary.

SOUTHEASTERN SURGICAL CONGRESS, Deauville Hotel, Miami Beach, Fl Mar. 9-12. Dr. Benjamin T. Beasley, 45 Edgewood Ave., S. E., Atlan 3, Ga., Secretary.

SOUTHWESTERN SURGICAL CONGRESS, New Brown Palace Hotel, Denve Mar. 30-Apr. 1. Dr. C. M. O'Leary, 1213 Medical Arts Bldg., Oklaho City, Okla., Secretary.

April

AERO MEDICAL ASSOCIATION, Hotel Statler, Los Angeles, Apr. 27-29. Dr Thomas H. Sutherland, P. O. Box 26, Marion, Ohio, Secretary.

ALABAMA, MEDICAL ASSOCIATION OF THE STATE OF, Birmingham, Ap 9-11. Mr. William A. Dozier, 17 Moulton Bldg., Montgomery, Executi *Secretary.*

AMERICAN ACADEMY OF GENERAL PRACTICE, San Francisco, Apr. 6- Mr. Mac F. Cabal, Wolker Blvd., at Brookside, Kansas City 12, Mo Executive Secretary.

AMERICAN ACADEMY OF NEUROLOGY, Statler Hotel, Los Angeles, Apr. 1 18. Dr. Joseph M. Foley, Boston City Hosp., Boston, Secretary.

AMERICAN ASSOCIATION OF ANATOMISTS, Seattle, Apr. 1-3. Dr. B. Fleme Univ. of Pa., Med. School, Philadelphia 4, Secretary.

AMERICAN ASSOCIATION FOR CLEFT PALATE REHABILITATION, Sherato Hotel, Philadelphia, Apr. 30-May 2. Dr. D. C. Spriestersbach, Uni Hosps., Iowa City, Ia., Secretary.

AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS, Seaview Countr Club, Absecon, N J., Apr. 15-17. Dr. William J. Engel, 2020 E. 9 St., Cleveland 6, Secretary.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS, Atlantic City, N. J., Apr. 1 17. Dr. Calderon Howe, 630 W. 168th St., New York 32, Secretary.

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS, Somerset Hotel, Boston, Apr. 23-25. Dr. Russell L. Holman, 1542 Tulane Ave., New Orleans 12, Secretary.

AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chicago, Apr. 16-18. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.

AMERICAN ASSOCIATION FOR THE STUDY OF NEOPLASTIC DISEASES, Hotel Greystone, Gatlinburg, Tenn., Apr. 30-May 4. Dr. Bruce H. Sisler, Bo 268, Gatlinburg, Tenn., Secretary.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Statler Hotel, Los Angeles, Apr. 21-23. Dr. Hiram T. Langston, 7730 Carondelet Ave., St Louis 5, Secretary.

AMERICAN COLLEGE OF OBSTETRICIANS & GYNECOLOGISTS, Traymore Hotel, Atlantic City, N. J., Apr. 5-9. Dr. John C. Ullery, 15 S. Clark St., Chicago 3, Secretary.

AMERICAN COLLEGE OF PHYSICIANS, Conrad Hilton Hotel, Chicago, Apr. 20-24. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Executive Secretary.

AMERICAN COLLEGE OF SURGEONS, Sectional Meeting for Surgeons and Nurses, The Queen Elizabeth Hotel, Montreal, Quebec, Apr. 6-9. Dr. Michael L. Mason, 40 E. Erie St., Chicago 11, Secretary.

AMERICAN GOITER ASSOCIATION, Chicago, Apr. 30-May 2. Dr. John C. McClintock, 149½ Washington Ave., Albany, N. Y., Secretary.

AMERICAN GROUP PSYCHOTHERAPY ASSOCIATION, WESTERN REGIONAL MEETING, Sheraton-Palace Hotel, San Francisco, April 2-3. Dr. H. S Morgenstern, Langley Porter Clinic, U. C. Medical Center, San Francisco, Chairman.

AMERICAN PHYSIOLOGICAL SOCIETY, Atlantic City, N. J., Apr. 12-16. Dr Ray G. Daggs, 9650 Wisconsin Ave., Washington, D. C., Executiv Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Civic Auditorium, Philadelphia Apr. 27-May 1. Dr. C. H. Hardin Branch, 156 Westminster Ave., Sal Lake City, Secretary.

AMERICAN RADIUM SOCIETY, The Homestead, Hot Springs, Va., Apr. 6-8 Dr. Robert L. Brown, Robert Winship Clinic, Emory University, At lanta 22, Ga., Secretary.

AMERICAN SOCIETY FOR ARTIFICIAL INTERNAL ORGANS, Shelburne Hote Atlantic City, N. J., Apr. 12-13. Dr. Charles K. Kirby, 110 Malone Bldg., University Hospital, S. E. Corner 36th and Spruce Sts., Philade phia 4, Secretary.

AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, Atlantic City, N. J., Apr. 13-18. Dr. F. W. Putnam, Univ. of Fla. Medical School, Gainesville, Fla., Secretary.

AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY, Atlantic City, N. J., Apr. 13-18. Dr. J. F. A. McManus, Univ. of Alabama Medical Center, Birmingham 3, Ala., Secretary.

AMERICAN SOCIETY OF INTERNAL MEDICINE, Conrad Hilton Hotel, Chicago, Apr. 19. Dr. Clyde C. Greene Jr., 350 Post St., San Francisco 8, Assistant Secretary.

AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS, Atlantic City, N. J., Apr. 13-17. Dr. Harold Hodge, Univ. of Rochester, Rochester 20, N. Y., Secretary.

AMERICAN SOCIETY FOR THE STUDY OF STERILITY, Shelburne Hotel, Atlantic City, N. J., Apr. 3-5. Dr. Herbert H. Thomas, 920 S. 19th St., Birmingham 5, Ala., Secretary.

(Continued on page 34)

THE JOURNAL
OF THE
American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 17 CHICAGO, ILLINOIS DECEMBER 27, 1958

COPYRIGHT, 1958, BY AMERICAN MEDICAL ASSOCIATION

EDUCATION IN MOTOR VEHICLE ACCIDENT PREVENTION

Amos E. Neyhart, University Park, Pa.

I WOULD LIKE to start my discussion with an appropriate quotation from the yearbook "Safety Education" prepared in 1940 by the American Association of School Administrators: "It is to the school particularly that we must look for the development of the knowledge, the attitudes, the habits, and the skills that are necessary if we are to live with reasonable safety in the modern world."

This quotation, I think, is especially appropriate at this time when we are putting renewed emphasis on education as a result of the launching of satellites by Russia and the United States. It is even more significant and important today—18 years later—than it was when originally prepared, for the entire world looks to education for guidance and direction.

However, since Russia and the United States launched their satellites, those of us in the field of education and especially those of us teaching courses in driver education will be severely criticized for participating in a program considered by many to be a frill. The emphasis for many months to come will be on science courses, and the elimination of home economics, shop, health and physical education, driver education, and other similar courses suddenly considered nonessential in this space age will be at least debated if not accomplished.

> *Too many leading educators, through ignorance, misinformation, or inertia, consider driver education a frill and would like to see it dropped completely. Evidence shows that youths trained in driving education programs while in high school have 40 to 66% fewer violations and accidents than similar groups not so trained. Now is the time for the physician to become a real crusader for one of the most important of our school subjects—driver education—that is, if it is believed that education should be preparation for living.*

Frankly, I feel that people are emotional and are not using their heads when orating and writing about the present "needs" in education. I also believe that the main reason for the present-day cry to eliminate driver education is the fact that many Americans have little knowledge of the urgency, objectives, scope, and results of the high school driver education program.

Both former President Truman and President Eisenhower have publicly stated that traffic accidents form a major problem in the United States and have called five President's Highway Safety

---

Administrative Head, Institute of Public Safety, Pennsylvania State University, and Consultant on Driver Education, American Automobile Association, Washington, D. C.

Read in the Symposium and Panel Discussion on Motor Vehicle Accidents and their Prevention in the Session on Traffic Accidents before the Section on Miscellaneous topics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

Conferences to do something about the situation. Killing 40,000 and injuring a million and a half annually is nothing less than an indictment against this great nation. Since the advent of the motor car, over 1,200,000 citizens have been killed, to say nothing of the milions seriously injured and the billions of dollars lost in property damages.

We now have evidence that youths trained in high school have 40 to 66% fewer violations and accidents than similar groups not so trained. This is ample evidence of the value of these courses and the need to extend them. And, further, think of the training in that important field of science in which chemical tests for intoxication, friction, centrifugal force, kinetic energy, gravity, motion, power, heat, light, color, and sound are discussed during the course.

We believe it is extremely shortsighted to feverishly teach many young scientists how to travel to the moon when, through lack of training in how to travel on this earth, their lives will be snuffed out completely or they will be turned into hopeless cripples before they have a chance to put their space travel knowledge to use.

We look to the educators to prepare youth for living now as well as in the future. Rather than eliminate learning in earth travel, let us increase it until every boy and every girl of legal driving age will be able to receive this instruction and driver education will assume its rightful role of importance in this age when the motor car is still very much with us. Let us cease to consider this area of education as a mere frill.

In spite of the present criticism, driver education is on the move both forward and "for good." The following progress report will serve as a basis for this statement.

Progress in Driver Education Programs

This year we are celebrating our 25th year in high school driver education. This new subject has stood the criticism, the growing pains, and everything else for a quarter of a century. The program progressed from one high school offering driver education during the 1933-1934 school term to 11,846 high schools during the 1957-1958 school term and from 20 students enrolled in that first course at State College, Pennsylvania, High School to 1,219,065 enrolled in the 1957-1958 courses. This is ample evidence that driver education is on the move and that this relatively new teaching field has the look of permanence.

Teacher Preparation.—There are over 800 college professors prepared to offer safety education courses for teachers of every grade level. This is real progress when we look back to 1937 when the first college professors' seminar in driver education was offered at the University of Kentucky.

There are over 18,000 high school teachers prepared to offer driver education courses. During the 1957-1958 school term, 453 colleges and universities offered 929 courses in safety education. This also is real progress when we look back to the summer of 1936 when Pennsylvania State University offered the first course for high school teachers in driver education.

In 1947, the State Council on Education in Pennsylvania established 12 semester hours of credit in safety education as the teacher certification requirement to teach driver education in Pennsylvania high schools. In addition, each teacher must hold a valid teaching certificate. Many of the states require the valid teaching certificate and two courses in the field of safety, one in general safety education and one in driver education. A few of the states require only a valid teaching certificate.

Organizational Programs.—Six states received the United States' top award in this field, the achievement award for the extent and quality of driver education programs conducted during the 1957-1958 school year. Six earned the progress award. This award program is conducted each year by the Association of Casualty and Surety Companies.

In 1938, when Dr. Charles Glenn was President of the American Association of School Administrators, it was decided to have a yearbook on the subject "Safety Education." Dr. Henry H. Hill was appointed chairman of the commission, and with the direction of a group of educators and safety specialists the book was released in 1940. This particular book gave visible evidence that educators were interested in safety education.

Another milestone in the development of the safety education program on a national basis was the establishment in 1943 of the National Commission on Safety Education, a division of the National Education Association (NEA). This commission gave prestige and status to the entire safety movement. Funds were made available in 1944 for the operation of the commission.

In 1949, the first conference of the new Pennsylvania Association for Safety Education (PASE) was held at Hershey, Pa. There are now close to 400 members of this association. The annual meeting offers both college and high school instructors an opportunity to exchange ideas and improve teaching methods. There are now 40 such state associations.

The presidents of the state associations met in Washington, D. C., in 1956 and formed the American Driver and Safety Education Association. The first conference was held in Philadelphia in 1957 in connection with the NEA centennial. The second conference was held at the University of Colorado, June 22-24, 1958. These conferences help the teachers improve their teaching in both the classroom and the practice driving part of the program.

The National Commission on Safety Education has arranged for three national driver education conferences. The first was at Jackson's Mill in 1949, the second at Michigan State University in 1953, and the third at Purdue University in 1958.

These national conferences are responsible for the administrative practices and policies used in driver education courses today. Thirty clock hours in the classroom and a minimum of six clock hours in practice driving for each student are standards recommended by the national conference.

Contributions.—During the 1957-1958 school term, the automobile dealers lent over 11,000 cars to schools at a value of over 24 million dollars. This is truly a significant civic activity on the part of the dealers.

Fifteen states now offer financial aid to schools when their driver education courses meet accepted standards. Bills will be introduced by other states, and in all probability 50% of the states will offer financial aid within the next five years. The details of the present plan are available from the American Automobile Association and the National Commission on Safety Education.

Teaching Techniques

The college instructors in Pennsylvania meet every year during the PASE conference to discuss ways and means to improve the safety education courses on the college level. In addition, they meet for two days in September to improve teaching materials and methods. California and Michigan also hold conferences regularly to bring the college professors together in an effort to improve their safety education courses.

Youth Driver Education.—The young people today are just as eager and anxious as adults to help solve some of the serious problems of the United States. One method that is being used successfully in the field of traffic is the holding of youth conferences; others include radio and television panels. These young people need the assistance of the driver education teachers in arranging facilities, transportation, discussion topics, speakers, and method of conducting such conferences.

For a number of years the Junior Chamber of Commerce has been sponsoring Teen-Age Road-e-os. In addition, many local areas conduct their own "road-e-os." If you cooperate in such an activity, you should make sure that every step is taken to make it of high quality. In our community, for instance, a road test is given as well as skill tests and a written test. These tests are administered by professionals in the field.

Economy Runs.—The economy run is gaining in popularity all over the nation. In most places it is conducted under the sponsorship of one oil company. However, in some places it is conducted with the cooperation of a number of oil companies and other organizations.

Adult Driver Education.—Each year over a million adults complete courses in driver education conducted by colleges, high schools, police departments, American Automobile Association clubs, commercial driving schools, motor vehicle fleets, and others. In a number of instances, the adult driver education schools are licensed by the state. Pennsylvania's commercial schools are under the supervision of the Department of Public Instruction. One of the outstanding schools for training commercial drivers is at North Carolina State College. The graduates have established an enviable record.

The Common Carrier Conference of the American Trucking Associations, Inc., is making plans to have vocational schools conduct courses for commercial drivers. This is now being done at Washington High School in Los Angeles.

The National Committee for Motor Fleet Supervisor Training, working cooperatively with over 50 colleges and universities, has prepared over 15,000 supervisors who have under their direction over 2 million drivers. Another forward move is the directive from Air Force Headquarters in Washington, D. C., requiring every airman 25 years of age and under to complete 10 hours of instruction in driver education. These different programs are certainly indications that driver education is on the move.

Driver Licensing and Preparation.—In Connecticut and Michigan, laws have been passed requiring boys and girls to complete in a satisfactory manner an approved course in driver education in order to get a license at 16 or 17 years of age. There is also considerable agitation for more junior license laws which would require approved courses and would permit driving only at certain hours without adult supervision.

There are a number of states that now permit boys and girls to practice in the school car with the approved instructors six months or a year before the age at which a license can be obtained. According to reports from the instructors, preference is given to the six-month period because there is too long a gap in a year's interval between course completion and the examination for a license.

Teachers, in general, do a fairly good job when conducting their driver education courses. However, there is always plenty of room for improvement. One of the big problems is the cost for the practice driving part of the program. Efforts are being made to cut this cost. One method is to use simulators, such as the American Automobile Association Auto Trainer or the Aetna Drivotrainer. Those who have made studies of the use of these devices say that they reduce significantly the amount of practice time. Some experiments showed that pupils with 12 hours practice first in a simulator reduced the actual behind-the-wheel time from six to three hours. Of course, we must consider equipment costs and the cost of the space for the simulators. But, in the long run, the cost per pupil should be less.

Other plans to help with the practice driving have included use of cadet teachers, high school seniors, and school bus drivers. In most instances, these plans are not very satisfactory because such persons are not professional teachers. Some instructors use flash film, commentary driving, or the discussion-decision technique to improve driving practice experience and to shorten time and costs.

In Michigan, the multiple-car plan is used quite extensively for the practice driving part of the program. One instructor, through the use of a public address system, or car radios, can handle from 6 to 12 cars on the driving range. The driving range usually includes signs, signals, markings, one-way streets, curves, parking stalls, and other traffic patterns found in regular driving.

It is quite evident from these different plans that a variety of approaches are being used to reduce the cost of the program and still produce good drivers.

Supervisors in Safety Education.—Twenty-five years ago we could have counted on the fingers of one hand the number of cities and states having a full-time supervisor in safety education. Today, practically every city and community, as well as every state, has at least one individual assigned full time or part time to safety education in the school system. In some instances, there is a full time staff worker in driver education alone. When this is the case, the program has acceptance by top educators.

Scientific Advancement

We are all aware of the research dealing with seat belts and harness, padded instrument panels, recessed steering posts, padded sunvisors, shatterproof glass in rear-view mirrors, special door latches, rearward seating, and, finally, the safety car with the driver in the middle and without a steering wheel. Such developments will most certainly affect our teaching.

We also know that it is now possible to keep a car in its own lane automatically and to warn drivers of impending dangers, such as curves and fog, electronically. Research in these fields will continue because of the help such installations will offer in reducing traffic accidents.

Conclusions

One of the big problems in driver education today is getting the acceptance and approval of top educators. Too many leading educators, through ignorance, misinformation, or inertia, still consider driver education a frill and would like to see it dropped completely. Others advocate its being scheduled as a vocational subject or conducted during the suggested 13th year in the public schools.

I believe such problems help us because we are now forced to stand up and speak out just as positively in favor of driver education as others are speaking negatively about this program. Please let your voice be heard in public. Now is the time to become a real crusader for one of the most important of our school subjects—driver education—that is, if you believe that education should be the preparation for living. We are counting on your help, not only as citizens and parents but as a group of people welded into one of the most effective of all organizations for combating human misery—the medical profession. We enlist your aid.

I would like to close with this basic concept concerning traffic, one that offers great hope in reducing the all-too familiar traffic accidents: Our greatest potential for achieving smooth, safe, orderly, and efficient movement of traffic is through a driver education program in every high school that reaches every boy and girl prior to the time when they become legally old enough to be licensed to drive.

This, then, is the long-range program that will eventually offer the greatest contribution to the development of good traffic citizenship. It doesn't cost to teach them to drive—it pays.

CHOLESTEROL PRESENT IN ALL CELLS.—Cholesterol is an alicyclic unsaturated alcohol present in all animal cells and in blood. It is the characteristic sterol of animals, the plant sterols having additional carbon in the side-chain. In the body, cholesterol functions as a precursor of the bile acids and of numerous hormones of the adrenals and gonads. Cholesterol itself is a constituent of lipoproteins and both in serum or in tissues may occur either free or esterified by fatty acids. . . . As well as being absorbed from food, cholesterol is synthesized in the animal body, as was shown quite early by feeding experiments. The liver is an important site of synthesis and appears to be the principal endogenous source of the cholesterol in blood plasma. Many other tissues are also known to synthesize the sterol: the intestinal mucosa, ovary, and all foetal tissues of the rabbit; the theca interna, theca externa, and zona granulosa of the hen's ovary; the adrenal cortex, kidney, the testis and skin are all sites of active synthesis.—J. W. Cornforth, M.Sc., D.Phil., F.R.S., and G. Popjak, M.D., F.R.IC, Biosynthesis of Cholesterol, *British Medical Bulletin*, September, 1958

THROMBOPENIC PURPURA AS A COMPLICATION OF MUMPS

Charles P. Kolars, M.D.
and
Wesley W. Spink, M.D., Minneapolis

Three adults with mumps had thrombopenic purpura as a serious sequela. Thrombopenia must be added to orchitis and meningoencephalitis as a complication of this not uncommon infection in adults. Although direct invasion of the tissues by virus may be responsible for the inflammatory reaction, the possibility also exists that a state of acquired hypersensitivity may be the cause. Steroid therapy is helpful in thrombopenia occurring as a complication of mumps.

Thrombopenic purpura and nonthrombopenic purpura are occasionally observed in patients with infectious diseases. Clement and Diamond[1] reported on the findings in 96 children with thrombopenic purpura. In 65 of these children the purpura was associated mostly with upper respiratory infections, but it occurred also as a complication of rubella, chickenpox (varicella), and infectious mononucleosis.

We are presenting the clinical course of three adults with mumps who had thrombopenic purpura as a serious complication. In reviewing the literature, we have been unable to find any documented instance of this complication occurring with mumps. Perhaps thrombopenic purpura appears more frequently in mumps than is realized, since the three patients were seen over a relatively brief period of time. Further emphasis should be given to this complication because of the difficulties encountered in controlling the bleeding.

Report of Cases

Case 1.—A 65-year-old woman entered the University Hospitals on March 7, 1955, because of bleeding. Having always enjoyed good health, the patient developed an occipital headache six weeks prior to admission. A week later parotid swelling appeared, which was soon followed by epistaxis and "red spots all over the body." Within the next few weeks, lethargy was associated with vaginal bleeding, hematuria, and ecchymoses.

Her only medicaments were salicylates and an iron preparation. Of considerable significance was the fact that just prior to her illness she had had close contact with several members of her family, including children, who had mumps. She was not certain of having had mumps previously. There was no history of a bleeding tendency. Her family history was irrelevant.

Physical examination revealed an obese woman with a normal temperature and pulse rate and a blood pressure of 165/85 mm. Hg. There was a fresh hemorrhage in the left ocular fundus. A grade 2 systolic murmur was heard over the precordium. The liver and spleen were not palpable. There was a generalized petechial eruption of the skin over the entire body, especially the legs.

The pertinent laboratory data revealed 3+ erythrocytes in the urine. Hematological data showed a hemoglobin level of 14.0 Gm. %, erythrocytes, 4,210,000 per cubic millimeter, leukocytes, 5,800 per cubic millimeter with 68% neutrophils, 27% lymphocytes, and 5% monocytes, platelets, 18,000 per cubic millimeter, a bleeding time greater than 15 minutes, and a clotting time of 5 minutes, with only a slight retraction of the clot in 17 hours. The prothrombin time was normal. The cuff test gave positive results. The reticulocyte count was 4.9%, and a section of sternal bone marrow showed a marked increase in megakaryocytes. Findings on the direct and indirect Coombs' test were negative. The four-day fecal urobilinogen excretion was normal. The complement-fixation test for mumps showed positive results in a dilution of 1:64. The L.E. cell test was negative. Liver function tests were normal except for a 3+ cephalin flocculation.

Because of the diffuse bleeding and the scarcity of peripheral platelets, she was given 200 mg. of cortisone orally for the first three days. No improvement occurred, and for the three following days 400 mg. of cortisone was administered daily. The daily intake of cortisone was then reduced to 300 mg. Because only 18,000 platelets per cubic millimeter were present and because of continued hemorrhage, splenectomy was carried out on March 18, 1955, after preparation with one unit of whole blood. The resected spleen weighed 180 Gm. and appeared normal, grossly and histologically. Cortisone therapy was continued. Two days after operation the platelets numbered 144,000 per cubic millimeter. The cortisone intake was reduced to 150 mg. daily on March 23, at which time there were 371,000 platelets and 18,000 leukocytes per cubic millimeter. The dose of cortisone was gradually reduced, and this therapy was discontinued on March 25, at which time 15 units of ACTH was administered. At this point there were 765,000 platelets per cubic millimeter. The platelet level then gradually stabilized at 90,000 to 100,000 per cubic millimeter. She was discharged from the hospital on April 6, 1955, after an uncomplicated postoperative period. She has had good health up through the last follow-up examination on June 10, 1958.

Comment.—This elderly woman undoubtedly had mumps with thrombopenic purpura as a complication. The number of platelets remained low through the period of steroid therapy, and splenectomy was followed by only a transient rise in the platelet level.

Case 2.—A 27-year-old woman was admitted to the University Hospitals on March 15, 1957. On Dec. 7, 1956, she was seen by her physician because of fever and parotid swelling. A diagnosis of mumps was made. There had been an exposure to the disease three weeks previously. Ten days after the onset of the parotitis, a petechial eruption appeared over the lower extremities, and thrombopenia was found to be present. She was admitted to a hospital on Dec. 18, 1956

From the Department of Medicine, University of Minnesota.

and given 300 mg. of cortisone daily for three weeks. The platelet count approximated 25,000 per cubic millimeter during this time. The cortisone dosage was reduced to 150 mg. daily on Jan. 19, 1957, and this therapy was continued for several weeks.

Because the platelet level failed to rise, she entered the University Hospitals for splenectomy on March 15, 1957. Further questioning at this time revealed that she had taken only salicylates prior to the onset of thrombopenia. There had been no previous history of her having had mumps. On examination she had an appearance resembling that seen in adrenal cortical hyperfunction (Cushing's disease). The temperature and pulse rate were normal, and the blood pressure was 120/70 mm. Hg. There was an acneiform eruption over her face and shoulders, and a few abdominal striae were present. The liver and spleen were not palpable. A few scattered petechiae were present on the legs.

Significant laboratory data showed a hemoglobin level of 12.4 Gm. %, leukocytes, 8,550 per cubic millimeter with 75% neutrophils, and a platelet count of 23,000 per cubic millimeter. The bleeding time was 10½ minutes and the clotting time 3½ minutes. The reticulocyte count was 2.2%. Clot retraction was normal. Normal serum protein values were found. The serum iron level was less than 20 μg. per 100 ml. Findings on three L. E. cell tests were negative. The direct and indirect Coombs' test results were negative. The complement-fixation test for mumps showed positive findings in a titer of 1:32. A four-day fecal urobilinogen excretion was normal. Sternal bone marrow aspiration on March 19, 1957, revealed a normal number of megakaryocytes, but they were morphologically abnormal in appearance.

On March 22, cortisone therapy was discontinued and she was given 40 mg. of prednisone daily. The platelet levels continued to fluctuate between 16,000 and 80,000 per cubic millimeter. Splenectomy was carried out on April 10, 1957. The spleen weighed 150 mg. and grossly and microscopically appeared normal. The platelet count just prior to surgery was 54,000 and 12 days later 826,000 per cubic millimeter. The steroid intake was gradually reduced, and this therapy discontinued on April 30, at which time the platelet count was 630,000 per cubic millimeter. When she was discharged on May 7, 1957, the platelet count was 450,000 per cubic millimeter. On follow-up visits it was observed that the thrombopenia had returned. On June 4, 1957, the platelet count was 80,000 per cubic millimeter and steroid therapy was resumed. By June 11, the count was 164,000. Over the succeeding weeks steroid therapy was gradually reduced and finally discontinued on Sept. 3, 1957. At this time the platelet count was 282,000 per cubic millimeter. When last seen on Feb. 4, 1958, she was in good health and the platelet count was 275,000 per cubic millimeter.

Comment.—The foregoing case report emphasizes the seriousness and chronicity of thrombopenia occurring as a complication of mumps. Steroid therapy did not abolish the thrombopenia, but it was helpful in controlling the bleeding tendency. Again, splenectomy failed to achieve any sustained rise in the platelet count.

CASE 3.—A 44-year-old man was admitted to the University Hospitals on April 1, 1958, because of bleeding gums and a generalized petechial eruption over the skin of his body. Seven days prior to admission he had had a severe headache, which was followed two days later by parotitis. Two of his children, aged 5 and 6 years, had had mumps three weeks before the onset of his illness. On the day before entry to the hospital he had noted right testicular pain and tenderness. On the morning of admission he had bleeding of the gums and observed a generalized petechial rash.

The only medicament he had taken prior to his illness was a salicylate. There was no history of mumps. For a number of years he had had a scaly erythematous rash over his cheeks which appeared each spring and fall. He had episodes of wheezing during the ragweed season.

Physical examination revealed a well-developed and well-nourished white man with a normal temperature and pulse rate and a blood pressure of 108/75 mm. Hg. No parotid swelling was present. The liver and spleen were not felt. The right testis was enlarged and quite tender. A severe petechial eruption was present on the skin of his neck, hard palate, arms, and legs.

The laboratory data revealed occasional erythrocytes in the urine. The hemoglobin level was 14.1 Gm. %, leukocytes, 6,800 per cubic millimeter with 66% neutrophils; platelet count, 12,000 per cubic millimeter, and prothrombin time, normal. A study of aspirated sternal bone marrow revealed slight hypoplasia with a moderate increase in the number of megakaryocytes. The complement-fixation titer for mumps was 1:128.

During the first six days of hospitalization, the platelet counts fluctuated between 8,000 and 34,000 per cubic millimeter and petechiae continued to appear. Beginning on April 7, 1958, 60 mg. of prednisone was given daily. Within 48 hours the painful orchitis had subsided, and by April 16 the platelet count rose to 110,000 per cubic millimeter. The dosage of prednisone was gradually reduced to 35 mg. daily, but further reduction was followed by a diminution in the number of platelets. On April 24, the platelet count was 52,000 per cubic millimeter and the dosage of prednisone was increased to 45 mg. daily. During the following three weeks the maximum platelet count was 95,000 per cubic millimeter. On May 15, 1958, the dosage of prednisone was reduced, so that by June 5, 1958, the platelet count had stabilized at about 100,000 per cubic millimeter. Finally, on July 7, 1958, the prednisone therapy was discontinued, the platelet level being 139,000 per cubic millimeter. He was asymptomatic.

Comment.—This man had two acute complications of mumps, orchitis and thrombopenia. The hemorrhagic tendency was serious, but persistent steroid therapy controlled the bleeding. It is interesting that, although splenectomy was not carried out in this patient, the natural course of the thrombopenic state was similar in character to that in the other two patients.

Summary and Conclusions

Mumps is not an uncommon infection of adult life. The complications can be painful and serious; they include orchitis and meningoencephalitis. Less commonly, pancreatitis and oophoritis occur. Thrombopenia must be added as a complication, and this is potentially serious. The pathogenesis of these complications is not clearly understood. Although direct invasion of the tissues by virus may be responsible for the inflammatory reaction, the possibility also exists that a state of acquired hypersensitivity may be the cause.

There is now substantial evidence showing that the inflammatory complications of orchitis and meningoencephalitis can be controlled by therapy with adrenocorticosteroids.[2] The present report indicates that steroid therapy is also effective in thrombopenia occurring as a complication of mumps. In two of the three patients steroid therapy was insufficient to correct the platelet deficiency but did control the bleeding tendency. In a third patient with orchitis and thrombopenic purpura, steroid therapy alone controlled both complications. It is suggested that mumps should be considered as a possible causative factor in cases of "idiopathic" thrombopenic purpura. The clinical course of these three patients suggests that splenectomy was not definitive in terminating the thrombopenic state. Steroids did control the bleeding tendency.

References

1. Clement, D. H., and Diamond, L. K.: Purpura in Infants and Children: Its Natural History, A. M. A. Am. J. Dis. Child. **85**:259-278 (March) 1953.

2. Petersdorf, R. G., and Bennett, I. L., Jr.: Treatment of Mumps Orchitis with Adrenal Hormones, A. M. A. Arch. Int. Med. **99**:222-233 (Feb.) 1957. Spitznagel, J. K.: Effects of Cortisone and ACTH in Mumps Meningo-encephalitis, Ann. Int. Med. **49**:61-69 (July) 1958.

OBJECTIVES FOR STATE MEDICAL SOCIETY TRAFFIC SAFETY COMMITTEES

John R. Rodger, M.D., Bellaire, Mich.

It is my belief that every state medical society should have an active traffic safety committee or should assign a traffic safety program to some appropriate existing committee of the state society. The Committee on Medical Aspects of Automobile Injuries and Deaths of the American Medical Association can develop suggested health standards for driving automotive vehicles, but these standards must be tailored to the individual needs of the separate states. Fortunately or not, the legal problems attendant on driving on the highways of the United States are functions of state governments rather than of the federal government. Educational campaigns to improve driving abilities are largely effective on a state basis. For this reason the successful cooperation of the medical profession in the field of traffic safety will be even more dependent on what state medical societies do than on what the A. M. A. does.

The cooperation of the medical profession is needed in the field of traffic safety, and effective leadership can be supplied by committees appointed by state medical societies. Their function should be to guide and stimulate; they can supply needed information to interested groups, seek to improve existing laws that affect automobile traffic, and cooperate in special projects of research and education. In addition to carrying out the strictly medical aspects of its activities, a traffic safety committee can do much to promote programs of training for student and adult drivers, supplement the efforts of civic groups and governmental agencies, and, in general, set good examples of driving habits, law observance, and good citizenship.

What can a state medical society do about this problem? I say "state medical society" rather than just the traffic safety committee of a state medical society, for success will come only as all the members of a state medical society contribute to meeting the problem under the leadership of a traffic safety committee. The job of the committee is to guide and stimulate. By itself, it can do little.

How large should such a committee be, and who should be on it? Five should be a minimum number. A committee of over 10 or 12 members becomes unwieldy. Interested members should come from many fields of medicine, not just one or two. Such areas would include general surgery and its subbranches most interested in trauma, general practice, internal medicine, eye, ear, nose, and throat, psychiatry, public health, and other related fields.

Such a committee may well spend one meeting or more just in finding out what the traffic situation is in that particular state, determining statistics, finding out something about the more important existing traffic laws, and meeting with a representative of the state police and state driver licensing agency. It will soon discover that there are many others just as interested in this traffic safety problem as physicians are and that the job is a cooperative one with no easy answers and no one master solution. The members of the committee will find that there is an avalanche of facts and present programs about which it knows very little. After looking over the field carefully, it should then settle on one or two projects at a time which are necessary and

---

Chairman, Study Committee for Prevention of Highway Accidents, Michigan State Medical Society.

Read in the Symposium and Panel Discussion on Motor Vehicle Accidents and Their Prevention in the Session on Traffic Accidents before the Section on Miscellaneous Topics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

reasonably attainable within a few years at most. All progress is agonizingly slow to those who are enthusiasts!

There is a large group of medical and a smaller group of nonmedical projects which such a committee might consider in view of the primary needs in an individual state. The following objectives are offered as suggestive only and not as all-encompassing.

Medical Objectives

The committee should first aim to provide the practicing physician with technical medical information regarding driving limitations for his patients. This can be done by drawing attention to (1) the A. M. A. manual soon to be published: "Medical Guide for Physicians in Determining Fitness to Drive a Motor Vehicle"; (2) special traffic safety editions of the state medical society journal, with the authors of the articles primarily, but not necessarily, from that state (the authors need not all be doctors); a recent such issue of the *Journal of the Michigan State Medical Society* contained articles with the following titles: "Are Your Patients Physically Qualified to Drive?" "Use of Chemical Tests for Intoxication in Michigan Law Enforcement," "Drugs and Driving," "The Highway Accident Problem in Michigan and What Has Been Done About It," "Automotive Crash Injury Research in Michigan," "Traffic Accidents and Safety," "The Speeding Ambulance," and "Emotional Problems in Driving"; (3) both intramural and extramural postgraduate courses for practicing physicians in both prevention and treatment of traffic injuries; and (4) appropriate information through the secretary's letter as well as other special media from the office of the state medical society.

The second objective should be to inform the driving public, through the use of proper media, of those medical conditions which may adversely affect driving proficiency. This can probably be done best by an effective distribution of the A. M. A. booklet, "Are You Fit to Drive?" either by the state medical society alone or in cooperation with other interested groups, such as industrial and insurance companies. Placement in local offices for driver licensing would be most effective if enough copies are available. Information to the public can also be given through the usual media of the press, television, radio, luncheon clubs, parent-teacher associations, and other groups. And let us not forget one of the most important means of all, i.e., individual contact with our patients!

Third, the committee should become familiar with the individual state's driver licensing laws and seek to improve them. This is a long, slow process and will not be accomplished overnight. It may take repeated years of introduction of legislation before it even gets out of a legislative committee and more years yet before it becomes law in an unemasculated form.

Fourth, the committee should cooperate with special projects, such as the Cornell Crash Project and other programs of medical research in the traffic safety field. This will mean work, but it will yield results that can be gained in no other way. The facts of traffic epidemiology and research should guide our efforts.

Fifth, the committee should seek to encourage the teaching of first-aid courses. Such courses, if they are to receive Red Cross recognition, must be taught either by trained lay instructors or by physicians.

Sixth, the committee should promote state and municipal standards for ambulance operators and equipment. Flint, Mich., has such regulations, and the Michigan State Medical Society is considering legislation of this type for possible introduction in the next session of the legislature.

Seventh, the committee should cooperate with state departments of public instruction in the securing of adequate health standards for school bus drivers.

Eighth, the committee should seek to promote, particularly in the larger county societies, traffic safety committees for county medical societies.

Nonmedical Objectives

There are several nonmedical fields of traffic safety in which it is advantageous and proper for a state medical society to lend its cooperation, even though in most instances the more strictly medical fields should receive a first priority of time and effort.

First, inclusive student driver training legislation should be a goal for each state. Comparison studies have pointed up the fact that students who have passed behind-the-wheel student driver training courses in high school have approximately one-half the accident rate of those who have not. In most states at least one-fourth of all traffic fatalities involve drivers 25 years of age and under, and in some states this figure is closer to one-third. In all the public schools of the United States, just over one-third of the students reaching legal driving age are able now to take behind-the-wheel driver training. Total figures for the private and parochial schools are not available, but they are undoubtedly much less than the one-third mention for public schools.

Benefits from a comprehensive student driver training program would be cumulative from year to year in this younger age group, probably averaging a total reduction of approximately 8% in the over-all traffic death rate when the program has been in existence for 10 years and allowing for a one-third coverage at the present time. Based on the total annual traffic toll of 38,000, this would mean a reduction of 300 deaths the first year, with increased savings of an additional increment of 300 lives each year until approximately 16,500 lives would be saved over a 10-year period. At least a part of the marked drop in traffic fatalities in Michigan over the past two and one-half years (over 25%) has been attributed to an inclusive driver training program.

Traffic experts say that the attitudes of individual drivers play a large part in the accident picture. Nowhere is there a better chance to develop, en masse, good attitudes along with the technical skills than in a comprehensive program of student driver training, for such courses must be taught by trained teachers with minimum standards for the subject material and the amount of time behind the wheel.

What is envisioned in such a comprehensive program? Michigan legislation requires that each teenager must wait until he is 18 to get his driver's license unless he has first passed an approved student driver training program, in which case he may get his license at the age of 16. This is the carrot in front of the donkey that gets the students into the courses! Every public high school must offer the course if it is requested by students.

In return for the fact that driver education is more expensive per pupil than other courses offered in high school, the state subsidizes the schools approximately $20-$25 per pupil, this money being secured by earmarking 50 cents a year from the driver license fee. Without some such subsidy, the schools, for the most part, would not be able to finance comprehensive training coverage, and it seems fair for those driving on the highways to help insure the young drivers becoming safer drivers. The young driver himself will have repaid the cost of his subsidy after paying for his driver license fees over a 45-year period.

In Michigan, private and parochial students who want to take the course may do so at a nearby public high school, with the public high school receiving the subsidy.

In the current critical examination of school curriculums, the place of driver education has been attacked by some, including Mr. Adlai Stevenson. I am sure that Mr. Stevenson and the other critics have not examined the available statistics on the problem. Furthermore, it is not necessary that basic subjects be sacrificed for driver education. The small high school in my community requires 20 units instead of the customary 16 for graduation, and 16 of these 20 must be in basic subjects. In Jackson, Mich., the extra time for driving is taken from physical education and not from basic subject time. Many of the larger high schools conduct courses in the summer for those unable to take them during the school year. Our future scientists will not suffer for being taught driver education while in high school, and, because of this training, they will stand a greater chance of staying alive long enough to be scientists! There is no hint that school critics would toss physical education out of the curriculum, and yet in terms of conservation of human life we must conclude that there is an even greater potential in a comprehensive student driver training program than in a physical education program.

Second, we should also urge the formation of special schools for adult driver training and for chronic traffic offenders. This is already being done in some states, including the state of Michigan, with schools organized on a fee basis which meets all their costs and adults either going voluntarily or being sent there by the courts for remedial instruction.

Third, we should cooperate actively in state and local citizens' traffic safety committees. Such committees are eager for support, on many issues they need our advice, and on safety matters of public education and proposed legislation we may need theirs! A citizens' traffic safety committee is much like a military division which is composed of different types of troops, not all of whom may be in action at the same time but who still need each other's support. We also must not forget that, as doctors, we also are citizens and have responsibilities apart from our profession.

Fourth, we should early offer the facilities of the state medical society to the governor, the state police, the state's licensing authority, and any other governmental agency on the state or local level which is attempting to meet the traffic safety problem. I scarcely need to point out that a by-product of these activities can be excellent public relations to the profession in the state.

Fifth, we should discipline ourselves and encourage our colleagues to set good examples in driving habits and law observance. There are times when, perhaps, it seems necessary for us to go faster than the speed limits and to take chances, yet, like a speeding and red-light crashing ambulance which kills more lives than it saves, the speeding doctor may be more of a health hazard than a health protector at times! Let us take the two-by-four out of our own eye before we start looking for the splinter in the other driver's eye!

Conclusions

A traffic safety committee of a state medical society must be more than just a window-dressing committee. It should carefully examine possible courses of action and programs for the society to undertake. The committee members and the society members they represent should come to see that, like anything else of value, a worthwhile traffic safety program will cost something in terms of time, effort, money, and sometimes, perhaps, even changed attitudes.

Finally, we can take the advice which Stonewall Jackson once gave to his younger officers: "Never underestimate yourself in action; never overestimate yourself in the official report."

117 S. Bridge St.

USE OF PROMETHAZINE (PHENERGAN) HYDROCHLORIDE IN OBSTETRICS

REPORT OF A TWO AND ONE-HALF YEAR SURVEY

John J. Carroll, M.D., C.M.
and
Robert S. Moir, M.B., Ch.B., Vancouver, British Columbia, Canada

Sedation and analgesia during the first stage of labor have been induced in more than 7,500 obstetric patients during a two and one-half year period by a regimen involving use of promethazine (25 to 100 mg. by deep intramuscular injection) and meperidine. The hospital charts of these patients have been compared with those of obstetric patients, during the two and one-half years before promethazine was used, with respect to maternal, fetal, and neonatal mortality, prematurity, duration of labor, and frequency of need for resuscitating the infant. The data showed that promethazine was a safe and effective tranquilizer, rendered labor less unpleasant, and reduced the need for those analgesics and anesthetics which have undesirable side-reactions. A shortening of labor was found and was particularly significant in uncomplicated primiparous cases. Resuscitation of the infant was almost never necessary. The average total dose of promethazine was 56.5 mg., and its effect in reducing the total amount of meperidine needed was convincingly demonstrated.

Our efforts to improve present methods for relief of pain of normal labor, as well as for management of dystocia, and at the same time to reduce perinatal mortality have led us to investigate a number of compounds credited with a relaxant action on the cervix. It is a common observation that labor is more difficult and dilatation unusually slow in the frightened, tense, and highly emotional patient.

Psychological preparation for parturition, although an important factor in prenatal care, has limited usefulness as the sole means of managing labor and delivery. Hypnosis is suitable for few patients, and the "childbirth without fear" concept popularized by Grantly Dick-Read is satisfactory for only about 25 to 30%, according to this author himself. In the great majority of cases, therefore, analgesic and sedative drugs are the only recourse. No drug, however, satisfies all criteria: (1) no increase in risk to parturient and fetus, (2) no interference with the labor mechanism, (3) no clouding of the mental faculties of the patient, (4) convenience of administration, and (5) promptness of action. All conventional agents, such as barbiturates and narcotics, are readily transmitted through the placental circulation, with well-known deleterious effects, and, in dosages within the limits of safety for the fetus, they are usually far from adequate for the needs of the mother.

Since fear-induced discharge of epinephrine increases the cervical tonus, we tried, in our parturient patients, to block the release of epinephrine with agents that depress the sympathetic nervous system (dihydroergotamine, dihydroergocornine, and similar substances). The use of these agents has now been largely abandoned in this hospital, and greater attention has been directed toward the potentialities of the various phenothiazine compounds with suppressive activity on the reticular formation of the central nervous system. Animal experiments[1] have shown that chlorpromazine hydrochloride (in doses of 3 to 6 mg. per kilogram of body weight) prevents the altering response to pain and that promethazine hydrochloride (in doses of 5 to 10 mg. per kilogram) produces the same effect.

Our first report[2] described the results of clinical studies employing combinations first of chlorpromazine with meperidine hydrochloride and then of promethazine with meperidine for sedation and analgesia during the first stage. The action of chlorpromazine proved most unpredictable, and labor appeared prolonged. The patients in whom adequate sedation was achieved showed evidence of decreased muscle tone; such limpness was believed partly to account for the increased duration of labor. Combination of promethazine with meperidine, on the other hand, was highly effective and produced results as predictable and analgesia as satisfactory as with twice the dose of meperidine alone. In consequence of these initial trials, more than 75% of the obstetricians and general practitioners on the staff of this hospital now use promethazine and meperidine in varying combinations for routine sedation during labor. Since predelivery medication is administered entirely at the discretion of the attending obstetrician, there is considerable variation in the volume and timing of the doses. In some cases both meperidine and promethazine are administered together; in others, the doses are administered in succession, from one-half hour to two hours apart. Single doses of each agent range from 25 to 100 mg. Promethazine is always administered by deep intramuscular injection.

Director, Department of Anesthesia (Dr. Carroll), and Fellow in Anesthesiology (Mr. Moir), Grace Hospital.

Since the publication of our first report,[2] more than 7,500 obstetric patients have been given sedation under this regimen. We have reviewed their charts and compared them with those of the patients in whom delivery was performed in the two and one-half years prior to the use of promethazine. All cases of infant morbidity and fetal and neonatal deaths have been reviewed in detail (tables 1, 2, and 3); also, the records of 263 consecutive unselected patients given this sedation in 1957, who were delivered of 265 infants (including two pairs of twins), were studied in detail. The results of these reviews will be presented here. We believe they will provide an adequate picture of the over-all results.

Table 1.—*Yearly Analysis Reports of Obstetric Data at Grace Hospital*

	Prior to Use of Promethazine			After Use of Promethazine	
	1953	1954	1955	1956	1957
Total births, no.	2,629	2,669	2,811	2,982	3,058
Neonatal deaths, full term and premature, no.	23	33	27	26	27
Rate per 1,000 live births, %	8.90	12.7	9.6	8.8	8.87
Neonatal deaths, term, no.	9	10	7	11	13
Rate per 1,000 live births, %	3.48	3.82	2.50	3.75	4.25
Neonatal deaths, premature, no.	14	23	20	15	14
Rate per 1,000 live births, %	5.42	8.70	7.15	5.14	4.57
Stillbirths, fetal mortality, no.	24	22	20	29	29
Rate per 1,000 live births, %	9.13	8.2	7.03	9.7	9.5
Stillbirths, premature, no.	14	9	7	15	23
Rate per 1,000 live births, %	5.42	3.44	2.50	5.14	7.52
Premature infants, discharged alive and well, no.	62	83	80	89	62
Maternal deaths, no.	0	0	1	1	0

Description of Series and Drug Administration

More than 7,500 patients were treated with promethazine. The neonatal and fetal mortality rates were not appreciably altered (table 1), and, in all, maternal sedation and anesthesia can be ruled out as a cause of death. The pulmonary neonatal morbidity, however, has shown a definite improvement. The decrease in neonatal pulmonary morbidity we attribute to reduction in the amount of respiratory-depressant agents (such as narcotics and barbiturates) required to control the discomforts of first-stage and second-stage labor and decrease in the level of general anesthesia necessary for delivery. During the past two and one-half years (July, 1955, through December, 1957), since the obstetric use of promethazine was initiated, the need of infant resuscitation has become so rare that the members of the resident staff have complained they are getting no training or experience in this important phase of infant care.

Paradoxically, with the decrease in the amount of narcotics used labor rooms have become quiet and peaceful. Except in the cases managed by the few physicians who do not prescribe promethazine, it is most unusual to hear patients in labor crying or complaining bitterly of their pains. The elimination of apprehension not only has reduced the discomfort of the patients but has enabled the case room staff more easily to evaluate their progress and has lessened the tenseness, fatigue, and irritability of the nurses in charge.

A detailed study of 263 consecutive patients treated with promethazine was made. Of these patients, 46% were primiparas. Ages ranged from 14 to 44 years.

Pregnancy had proceeded without incident in 214 (81%). Complications in the remainder included two cases of preeclamptic toxemia. Moderate to excessive vomiting during pregnancy had occurred in 17 patients.

Gestation was of normal duration in 89%. In 3% labor was premature, and 8% of the patients went into labor at 41 to 43 weeks.

On admission, about 75% appeared calm or were able to conceal their natural nervousness and fear of pain, while the other 25% were openly frightened and apprehensive.

Dosage.—Medication was usually administered according to the plan followed in the initial study; i. e., when the patient began to complain unduly of her discomfort, 25 to 50 mg. of promethazine and 50 mg. of meperidine was administered intramuscularly regardless of the extent of dilation. Thus, many patients, especially older primiparas and those whose labor was associated with complications (23 patients), received the initial dose early in the first stage. The dose was repeated at

Table 2.—*Analysis of Full-Term Neonatal Deaths by Year*

Condition	1953	1954	1955	1956	1957
Respiratory					
Hyaline membrane disease	1	5	2	1	2
Fetal anoxia	2*	...	1†	1‡	...
Congenital atelectasis (one of twins)	...	1	...	...	...
Acute interstitial pneumonitis	...	...	1	...	...
Neonatal asphyxia (cause undetermined)	...	...	...	...	1
Cardiac					
Transposition of great vessels	...	1	...	1	1¶
Tricuspid valve incompetency	...	...	...	1	...
Tetralogy of Fallot	...	...	...	1	...
Congenital cor biloculare	...	...	...	...	1
Congenital cor triloculare	...	...	...	...	1
Rh incompatibility					
Erythroblastosis	1	1	...	2§	...
Pulmonary infarction (during replacement transfusion)	...	...	...	...	1
Hemolytic disease (twins)	...	...	...	...	2
Other					
Spina bifida	2	...	...	...	...
Congenital diaphragmatic hernia	1	1	...	...	...
Congenital dysplasia of cerebrum	1	...	...	...	...
Congenital hypoplasia of kidneys	1	...	...	...	...
Congenital agenesis of kidneys	...	1	1	...	...
Massive hemorrhage of adrenals	...	...	1	...	...
Subarachnoid hemorrhage	...	...	1	1‖	2#
Intracranial hemorrhage (from difficult labor)	...	...	...	1	...
Anencephaly	...	...	...	1	...
Mongolism (primary atelectasis)	...	...	...	...	1
Vacuolation in central nervous system (possible x-radiation effect)	...	...	...	...	1
Totals	9	10	7	11	13

*Placenta previa.
† Premature separation of placenta.
‡ Cause undetermined.
§ Pulmonary embolism during replacement transfusion.
‖ Difficult delivery.
¶ Aorta and pulmonary vessels.
# One difficult rotation and delivery and one breach presentation.

the discretion of the labor room nurses or according to the individual physician's orders and, occasionally, if indicated, in an amount larger than that used initially. Although we discouraged the use of other agents, a few obstetricians, in rare instances, supplemented the medication with a small dose of some other narcotic or barbiturate.

For the individual patient the total dosage of promethazine ranged from 25 mg. (14%) to 125 to 150 mg. (5%). Fourteen per cent required 75 mg. and 11% 100 mg. The majority (56%) obtained adequate sedation with 50 mg. In uncomplicated cases meperidine was required for analgesia in total doses of 25 to 200 mg. Eighty per cent received 50 or 100 mg. In protracted cases with abnormalities of presentation or other difficulties and in trial labor, pain was adequately relieved in 50% with 50 or 100 mg. of meperidine. The remainder received 125 mg. or more, and 275 mg. was required by two patients (table 4).

Table 3.—*Analysis of Term Stillbirths by Year*

Condition	1953	1954	1955	1956	1957
Antepartum deaths					
Toxemia of pregnancy	1	...	...	...	...
Rh incompatibility	2	2	2	1	2
Placental infarction	1	1	3	...	...
Fetal anoxia	2*	...	2§	...	2¶
Antepartum hemorrhage	...	3‡	1	4	...
True knot in cord	...	1	...	...	...
Nuchal cord	...	...	...	...	1
Hydrocephalus	...	...	...	...	1
Unknown cause	...	...	2	1	...
Totals	6	7	10	6	6
Intrapartum deaths					
Breech presentation	2†	...	1‖	...	...
Premature separation of placenta	1	1	...	4	...
Siamese twins	1	...	...	...	...
Fetal asphyxia (traumatic delivery)	...	1	...	...	...
Intra-alveolar hemorrhage	...	1	...	...	...
Placental insufficiency (one of twins)	...	...	1	...	...
Prolapse of cord	...	...	...	1	2
Premature rupture of membranes	...	...	...	1	1#
Hydrocephalus (craniotomy)	...	...	...	2	...
Pulmonary edema (cause undetermined)	...	...	...	...	1
Congenital atelectasis (cause undetermined)	...	...	...	...	1
Totals	4	3	2	8	5

* Cause undetermined.
† Difficult delivery.
‡ Placenta previa.
§ Cord around neck.
‖ Prolonged labor.
¶ With asphyxia; cause not definitely determined.
# Intrauterine pneumonia.

Although most patients (61%) received the last dose of meperidine one to two hours before delivery, the timing of this dose ranged from eight minutes to 18 hours before delivery.

For the entire 263 patients, the average total dose of promethazine was 56.5 mg. and of meperidine 93.7 mg. (table 5).

Results

Average Duration of Labor. In uncomplicated cases, the average length of the first stage, for primiparas, was about 11 hours and of the second stage about 35 minutes. The total length of uncomplicated first-stage and second-stage labor for primiparas averaged 11 hours and 35 minutes. For the multiparas in this group, the first stage averaged seven hours, 30 minutes, and the second stage 20 minutes. The total length of uncomplicated first-stage and second-stage labor in the multiparas averaged seven hours and 50 minutes (table 6).

Table 4.—*Distribution of Total Dose of Meperidine Required for Adequate Analgesia Throughout Labor*

Meperidine, Mg.	Uncomplicated Labors, %	Protracted Labors, %
25	3	...
50	40	15
75	1	...
100	40	35
125	1	30
150	7	
200	8	
250-275	...	20*

* Four patients.

For difficult and protracted cases, in which rotation and delivery with midpelvic forceps was required, the total duration ranged from 15 hours and 10 minutes to 55 hours and 15 minutes, with an average of approximately 27 hours and 50 minutes.

Trial labor, conducted in five primiparas, ranged from 8 to 34 hours and averaged 26 hours and 23 minutes (table 6).

Presentation.—Eighty-eight per cent of the fetuses were in cephalic presentation. Difficulties in descent and abnormalities of position and presentation, such as transverse lie, transverse arrest, and shoulder dystocia (two cases), occurred in 6%. The breech presentation occurred in 3%. In the remaining 3%, cephalopelvic disproportion, small outlet, deep transverse arrest, and presence of Bandl's constriction ring (in a 31-year-old primipara) necessitated cesarean section.

Anesthesia.—Delivery was performed in 71% of patients with uncomplicated cases under general anesthesia. Intermittent inhalation of nitrous oxide and oxygen was used for analgesia during painful second-stage contractions; for delivery, deeper anesthesia was induced with cyclopropane or trichloroethylene. The average duration of general anesthesia was about 38 minutes. Peridural anesthesia was used in 28% of patients. Two multiparas were delivered without use of anesthetic agents.

Table 5.—*Potentiation of Analgesic Action of Meperidine by Promethazine*

	Patients, No.	Promethazine, Av. Total Dose per Patient, Mg.	Meperidine, Av. Total Dose per Patient, Mg.
Routine sedation in controls (prior to use of promethazine)	435	...	156.8
1955 series	300	38.5	93.0
1957 series	263	56.5	93.7

Rotation and delivery with midpelvic forceps was performed with the patient under anesthesia with nitrous oxide and trichloroethylene (six patients) or under peridural anesthesia (nine patients). Average duration of anesthesia in this group was about one hour and five minutes.

Cesarean sections were performed with the patient under subarachnoid block anesthesia with use of tetracaine hydrochloride.

Delivery.—Delivery was spontaneous in 50% of the patients (28 primiparas, 104 multiparas), and for 42% low forceps were used (77 primiparas, 33 multiparas), in a few cases after manual rotation. For 5% (10 primiparas, 5 multiparas) midpelvic forceps rotation and delivery were required.

In 55% of patients with vaginal deliveries episiotomy was performed (87 primiparas, 57 multiparas), and 6% of patients experienced lacerations. The umbilical cord was wound around the neck of the fetus in five cases. The placenta was retained in two primiparas; manual extraction was performed in one of these after one-half hour. Of the eight cesarean operations (3%), one was a repeat section.

Mortality.—There were three antenatal deaths (a fetal mortality of 1%). One was in a stillborn female, delivered spontaneously with shoulder presentation, of a 35-year-old multipara at 42 weeks' gestation. Labor was medically and surgically induced 48 hours after rupture of the membranes. Death was attributed to intrauterine pneumonia, intramedullary adrenal hemorrhage, and septicemia. The second was in a stillborn male of a 26-year-old multipara by spontaneous vertex delivery after 26 hours' labor at 40 weeks' gestation. Death was believed to be the result of placental separation, since no fetal heart sounds had been detectable for two days prior to induction of labor. The third fetus in this group was aborted at 28 weeks' gestation; the mother was a 26-year-old primipara. There were no maternal deaths.

Infants.—Ninety-five per cent of the 262 viable infants breathed and cried spontaneously within one minute of delivery; 3.5% required mild resuscitation with removal of mucus from the pharynx and administration of oxygen by mask, and 1.5% (four infants) showed some respiratory depression and received, in addition to oxygen in positive-pressure breathing, intravenous injection of a narcotic antagonist (nalorphine hydrochloride, 0.2 mg.).

One child in the latter group was delivered with low forceps, with the mother under peridural anesthesia for 60 minutes, after 21 hours and 50 minutes' labor. The mother had received a total of 150 mg. of meperidine and 100 mg. of promethazine during labor. In the second case, the umbilical cord was wound around the neck; transverse arrest and shoulder dystocia necessitated forceps rotation and delivery with the mother under peridural anesthesia for one hour and 54 minutes, after labor of 15 hours. The predelivery medication of the mother had consisted of 250 mg. of meperidine and 150 mg. of promethazine. In the third case, the infant was delivered by cesarean section of a mother who had shown symptoms of preeclamptic toxemia. This patient had received 3 grains (0.19 Gm.) of phenobarbital (Luminal) sodium and ¼ grain (15 mg.) of morphine, in addition to 50 mg. of promethazine in the preanesthetic medication. The fourth infant, delivered spontaneously after 12 hours and 50 minutes' labor, showed evidence of asphyxia as a result of a tight nuchal cord. The mother had received 200 mg. of meperidine and 75 mg. of promethazine for predelivery analgesia and sedation.

Nine of the 262 viable infants had either congenital malformations (six infants) or symptoms suggesting brain damage (three infants, or 1% of the series).

The infants exhibiting signs of neurological damage included one male in whom cerebral palsy was probable (he had been delivered of a primipara, with low forceps, under peridural anesthesia of two hours' duration after 20 hours of labor), one male with symptoms of meningism (delivered of a multipara, with low forceps, under general anesthesia for 30 minutes after about 15 hours' labor), one female with symptoms of cerebral irritation (delivered of a primipara, with low forceps, under peridural anesthesia for 45 minutes after 20 hours of labor, and with a tight nuchal cord).

Postpartum Period.—Vomiting occurred in four patients after delivery and was controlled in each case by an additional injection of 25 mg. of pro-

TABLE 6.—*Average Duration of Labor*

	Primiparas					Multiparas				
	Patients, No.	Stage 1		Stage 2		Patients, No.	Stage 1		Stage 2	
		Hr.	Min.	Hr.	Min.		Hr.	Min.	Hr.	Min.
Eastman, N. J.: Williams Obstetrics, ed. 10, New York, Appleton-Century-Crofts, Inc., 1950		16		1	45		11		1	
DeLee, J. B., and Greenhill, J. P.: Principles and Practice of Obstetrics, ed. 9, Philadelphia, W. B. Saunders Company, 1947		16		1	45		12			15-30
Present study										
Controls	130	12	53	1	12	150	7	26		16
Chlorpromazine and meperidine	127	16		1		72	10			14
Promethazine and meperidine (1955)	135	11	43	1	7	165	8	55		19
Promethazine and meperidine (1957)	120					143				
Uncomplicated deliveries	105	11			35	135	7	30		20
Abnormally difficult deliveries*	10	26	8		59	51‡	24		1	
Trial labor before cesarean section†	5									

* Abnormalities in these 15 cases not attributable to predelivery medication.
† Cesarean operations for all multiparas and for one primipara were performed without trial labor.
‡ Includes one multipara delivered with midpelvic forceps after total labor of 55 hours, 15 minutes.

methazine. Two patients experienced postpartum hemorrhage, one on the 1st and one on the 10th day. Dehiscence of the episiotomy occurred in one patient. One had endometritis, a second pyelonephritis, and a third cystitis. Three complained of pain in the back and coccyx and one of headache (a multipara delivered under general anesthesia). Enlargement of the spleen was observed in one patient; monilial infection of the episiotomy developed in another; and a third had hemorrhoids.

Complications developed in six infants during the postpartum period; infection of the umbilical stump, thrush of the mouth, and impetigo on the face occurred in each of three infants. Purulent conjunctivitis occurred in two infants. A toxic erythema developed in one who had received a narcotic antagonist. No bacteria were found in cultures of nose and throat.

Ninety-nine per cent of the infants were discharged in good general condition. Of the remainder, the condition of two was considered "fair" (one infant had a congenital heart lesion and one showed symptoms of meningism). One infant with esophagotracheal fistula was transferred to another service for further evaluation.

Comment

The findings in this survey confirm the impressions obtained in our controlled initial study. We believe the best effect may be achieved by administering 50 to 75 mg. of promethazine intramuscularly early in labor before analgesia is needed. The sedation provided by one dose lasts four to five hours; the dose may be repeated as indicated. As distress becomes more severe, meperidine may be injected intramuscularly in doses of 50 mg.

Before the potentialities of promethazine in the obstetric field were realized, meperidine was used, we feel, in doses larger than were necessary to control the actual pain. Such doses were administered mainly because the parturient was excited and frightened and her appreciation of the contractions was exaggerated. On administration of promethazine early in the first stage, however, the patient is relaxed and relieved of her fears, so that effective labor is soon established, especially in the primipara. She sleeps or rests between pains throughout the course but remains mentally clear; thus, her own estimate of the need of analgesia becomes more reliable.

The atmosphere of the labor room is noticeably quieter; it is rare to hear a patient cry out even at the peak of the contractions. One of us (R. S. M.) thought, on first acquaintance with the labor room here after arrival from Britain, that the patients were "abnormally" quiet. He was surprised to find that the average total dose of meperidine required per patient was quite small. An obstetrician recently returned from New York was similarly impressed and believed the patients were under the influence of heavy doses of sedatives.

The patient arrives in the delivery room in a comparatively unfatigued state and, hence, is better able to cooperate with the anesthetist and obstetrician; she does not resist the anesthetic and under light nitrous oxide anesthesia is able to push effectively with her contractions.

Our experience, in common with that of other workers,[3] suggests that promethazine potentiates all anesthetic agents. Therefore, rapid induction of deeper anesthesia for delivery of the head is accomplished with smaller dosage. Patients are usually awake or can be aroused soon after delivery and repair, although they generally remain drowsy for several hours post partum.

The degree of relief provided by promethazine-meperidine medication is difficult to assess from the patients' statements after delivery. It may be impossible to obtain from multiparas reliable information for a valid comparison with previous obstetric experiences without asking leading questions. However, a multipara will usually state that the contractions were less distressing and that she was better able to relax and sleep in the intervals between pains than in previous labors managed with conventional medication.

The suppressive action of promethazine on the alerting response to pain, as demonstrated in animals, may explain the obvious relaxation produced in the parturient. This is apparently reflected in the shortening of labor[4] (particularly significant in primiparas) and in the definite reduction of the total amount of narcotics required. In our continued experience of two and one-half years with this regimen, we have gradually increased the average total dose of promethazine per patient and have steadily reduced the total amount of meperidine (table 5).

The antihistaminic, antiemetic,[5] antiedema,[6] and atropine-like[7] properties of the compound, as observed by others, have been clinically demonstrated in these patients. No evidences of sensitivity to the medication have developed. Our obstetricians have the impression that the antihistaminic action of the compound is reflected in lessened edema of the tissues traumatized by episiotomy or laceration and in more rapid healing after the repair. The drying action is such that atropine is no longer administered even before anesthetization with cyclopropane, and the strong antiemetic effects have rendered vomiting an extremely unusual experience even during and after use of anesthetic agents that predispose to emesis. A sedative is especially valuable when it reduces the incidence of vomiting and, consequently, the catastrophe of aspiration.

Unlike chlorpromazine and some other ataraxics, promethazine does not alter the maternal blood pressure or pulse rate or unfavorably influence the fetal heart rate. Thus, patients in shock, from whatever cause, are relieved of the additional insult of drug-induced hypotension. Similarly, fetuses in distress are not embarrassed further by a maternal blood pressure too low to provide adequate transport of oxygen across the placenta.

Promethazine is unaffected by narcotic antagonists. Should the mother have been given narcotics to the extent that either her or her baby's respiratory center is depressed, the antagonists are as effective as if the narcotics had been given alone. The drug is not in itself an analgesic; therefore, when pain is present, the administration of a narcotic or other analgesic is indicated. It has been our experience in these 7,500 obstetric cases and in over 15,000 surgical cases of all types and in all age groups that there are practically no contraindications to the use of promethazine. In a few elderly arteriosclerotic patients, intramuscular injection of over 75 mg. has given rise to a state of confusion and restlessness. This condition has been controlled easily by small doses of meperidine.

Promethazine is not a panacea for all the problems of obstetrics. It is an effective tranquilizer and, as such, renders labor less unpleasant and reduces the need for those analgesics and anesthetics which have undesirable side-actions. It is a safe drug with no undesirable side-effects, and its administration does not interfere with or preclude the use of any other drugs which the physician might wish to use.

Condition of Fetus.—Recent chemical studies[8] of fetal cord and maternal venous blood samples seem to indicate that promethazine either does not enter the placental circulation or does so slowly and in insignificant amounts. However, whether the compound crosses the placental barrier or not appears clinically unimportant, because it obviously has little or no adverse effect on the fetus.

The fetal respiratory centers are evidently benefited by the significant reduction in the dosage of depressant agents required for analgesia and anesthesia in the mother.[9] Spontaneous respiration in the newborn infant is the rule. Resuscitation is almost never required, except when some abnormality of delivery is involved or the infant has been asphyxiated by the winding of the cord about the neck or body. The use of narcotic antagonists has been almost eliminated. On delivery to the nursery, the infants are usually pink, crying lustily, and showing good muscle tone—a circumstance which impresses both pediatricians and nursing staff.

Fetal and Neonatal Mortality.—Analysis of the records covering the period from 1953 through 1957 (i. e., two and one-half years before and two and one-half years after the introduction of promethazine into predelivery medication) shows, first, no significant alteration in the incidence of full-term antepartum and intrapartum deaths. Aside from those caused by congenital anomalies and Rh incompatibility, the majority were (or are assumed to have been) the result of faults in the placenta or cord (table 1). Analysis shows, second, no pronounced difference in the incidence of full-term neonatal deaths (tables 1 and 2). Again, most of these deaths are the result of Rh incompatibility and congenital anomalies. Although the number of deaths from respiratory causes does not show a marked change during the period under review, the over-all incidence of respiratory complications has declined.

Morbidity.—Morbidity in the newborn infant from pulmonary complications, especially atelectasis and pneumonia, showed a significant decrease in the first two and one-half years that promethazine was used.

Since resuscitation of the newborn infant is now so infrequent, drug-induced respiratory depression apparently has been reduced to a satisfactory low level. We feel that, if this is so, neonatal respiratory depression from predelivery medication of the mother is now less important as a cause of neonatal death and morbidity than difficult delivery. However, the fact remains that in premature and complicated labors even small doses of respiratory depressants may be sufficient to upset the delicate balance governing survival.

Summary

The charts for more than 7,500 obstetric patients to whom promethazine and meperidine were administered for predelivery sedation-analgesia were reviewed. These were compared with the records covering the two and one-half years prior to the use of promethazine in obstetrics. Records for 263 consecutive, unselected patients delivered in 1957 were reviewed in detail. Forty-six per cent were primiparas. Labor was premature in 3%.

The average total dose of promethazine per patient has been gradually increased and the total amount of meperidine used consistently reduced. The total dose of promethazine averaged 56.5 mg. and of meperidine 93.7 mg. per patient, including those in whom labor was attended by abnormalities. The results with the promethazine-meperidine combination were as predictable as those from almost twice the amount of meperidine used alone; maternal analgesia and relaxation were vastly superior, and infant morbidity was decreased.

In 92%, labor and delivery were without complication or special difficulties. In 5%, labor was protracted and difficult, necessitating midpelvic forceps rotation and delivery. Cesarean section was performed in 3%. In none of these complicated cases was medication a contributing factor. The fetal mortality was 1%, and there were no neonatal deaths.

The analgesia of anesthetics and analgesics is potentiated by promethazine without any alteration of their action on the respiratory center; therefore, smaller doses are effective but less depressing. Atropine is no longer used before induction. Vomiting is rare, even with use of anesthetics that predispose to emesis.

The medication does not alter the vital signs in the mother or affect the fetal heart rate. This is of benefit to patients in shock and to infants who already have hypoxia.

Ninety-five per cent of the viable infants cried spontaneously within one minute of delivery. Resuscitation is almost never necessary, and the use of narcotic antagonists has been almost eliminated.

There has been little or no change in the incidence of full-term antepartum, intrapartum, and neonatal deaths. Morbidity in the newborn infant from pulmonary complications has been reduced. The shortening of labor is particularly significant in uncomplicated primiparous cases.

The combination of meperidine and promethazine for patients in labor is recommended, since this regimen provides superior sedation-analgesia and is attended by greater safety than is use of meperidine alone.

1530 W. 37th Ave. (Dr. Carroll).

The promethazine hydrochloride used in this study was supplied as Phenergan hydrochloride by Poulenc, Ltd., Montreal, Canada.

References

1. Himwich, H. E.; Rinaldi, F.; and Willis, D.: Examination of Phenothiazine Derivatives with Comparisons of Their Effects on Alerting Reaction, Chemical Structure and Therapeutic Efficacy, J. Nerv. & Ment. Dis. **124:**53-57 (July) 1956.

2. Carroll, J. J., and Hudson, P. W.: Chlorpromazine and Promethazine in Obstetrics, Canad. Anaesth. Soc. J. **2:**340-346 (Oct.) 1955.

3. Hopkins, D. A. B.: Some Observations of Use of Phenothiazine Derivatives in Anesthesia and Their Mode of Action, with Special Reference to Chlorpromazine, Canad. M. A. J. **75:**473-479 (Sept. 15) 1956.

4. Fitzgerald, W. J.; Garcia, R. R.; and Cassidy, J. J.: Clinical Evaluation of Phenergan in Management of Labor, New York J. Med. **58:**1514-1515 (May 1) 1958.

5. Ducrot, R., and Decourt, P.: Comparative Study of Antiemetic Action of Several Synthetic Antihistamines, Compt. rend. Soc. biol. **145:**356-358 (March) 1951. Dillon, G. P., Jr.: Clinical Evaluation of Promethazine for Prevention of Postoperative Vomiting, Am. Pract. & Digest Treat. **8:**1571-1575 (Oct.) 1957.

6. Halpern, B. N.: Recent Advances in Domain of Antihistaminic Substances: Phenothiazine Derivatives, Bull. New York Acad. Med. **25:**323-330 (May) 1949.

7. Halpern, B. N., and others: Antihistaminiques de synthèse et taux des anticorps, Ann. Inst. Pasteur **76:**288-291 (March) 1949.

8. Adelman, M. H.; Fisch, H.; Jacobson, E.; and Katz, J.: Studies of Promethazine with Measurements of Concentrations in Venous Blood, Fetal Cord Blood, and Cerebrospinal Fluid, Anesthesiology **19:**93-94 (Jan.-Feb.) 1958.

9. Gordon, L. E., and Ruffin, C. L.: Promethazine as Adjunct to Obstetrical Analgesia and Sedation: Series of 500 Cases, Am. J. Obst. & Gynec. **76:**147-151 (July) 1958. Reference 4.

CAUSES VERSUS SYMPTOMS IN AUTOMOBILE ACCIDENTS

Robert C. Blossom, Sacramento, Calif.

Recently, a member of the American Medical Association forwarded to the Department of California Highway Patrol a request that a representative of this department present a paper before the Committee on Medical Aspects of Automobile Injuries and Deaths. The context of the paper was to be "Causes of Automobile Accidents." This request seemed appropriate, as the California Highway Patrol presently employs approximately 2,000 officers who are well trained in accident investigation and, during the past 30 years, has carefully analyzed investigation reports covering more than 2 million automobile accidents.

Data secured from these reports are coded, tabulated, and exposed to the mathematical scrutiny of an electronic computer capable of calculating

Basic causes of automobile accidents cannot be classified in such terms as speeding, wrong side of the road, or drunken driving. True causes must be listed in such terms as anxiety, causing preoccupation; heart attack, resulting in loss of consciousness; or prolonged use of alcohol, resulting in psychotic condition. The most effective method of treating the problem of automobile deaths and injuries is the attacking of the basic causes, thereby effecting a reduction in the number of accidents. The most effective approach to accident prevention is through active, planned use of methods available only to the medical profession.

Research and Development Officer, California Highway Patrol.

Read in the Symposium and Panel Discussion on Motor Vehicle Accidents and Their Prevention in the Session on Traffic Accidents before the Section on Miscellaneous Topics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

mathematical correlations at the rate of 200,000 per minute. The finished analytic summaries are transmitted to the research and development officer for his review prior to dissemination.

Certainly, the research and development officer should have a wealth of information regarding the causes of traffic accidents. However, when the request from the A. M. A. was referred to me, I was forced to reply that the factual data regarding accident causes were almost nonexistent. This statement appeared so unreasonable that I was asked to appear before the Committee and explain it. The basis for the statement was as follows.

The Search for Basic Causes

For 30 years those agencies responsible for dealing with the social illness called traffic accidents have adopted almost the same method as the medical field dealing with the common cold. In other words, they have constantly explored methods of treatment of the symptoms of the illness and have realized almost no progress in attempts to analyze basic causes.

This fact will become self-evident if one considers such subjects as types and degrees of injuries, chemical tests to determine intoxication, and effect of seat belts. Each discussion may provide assistance to accident prevention agencies but will not further the search for facts regarding basic causes. The reason for this is that basic causes cannot be classified in such terms as speeding, wrong side of the road, or drunken driving. True causes must be listed in such terms as anxiety, causing preoccupation; heart attack, resulting in loss of consciousness; or prolonged use of alcohol, resulting in psychotic condition.

The validity of this conclusion is borne out by a recent analysis of coroners' reports covering motor vehicle deaths submitted to this department. In 653 reports submitted by an agency that had access to adequate postmortem examination, 30 of the reported deaths received preliminary listing as "may have been due to natural causes." Later, autopsies increased this figure to 62. The inability to determine whether physiological conditions caused the accident or the accident aggravated the existing condition may have restricted additions to this figure.

From this small sample, plus logic, it would appear that existing and induced physiological conditions of drivers involved in fatal automobile accidents may constitute a major portion of the true causes of death in an automobile. Our logic may be based on scrutiny of the actual time spent in automobiles. A total of 1.5 billion hours—200 hours per driver per year or approximately 3% of total time of each driver—is spent in an automobile in California. If 3% of the natural deaths due to chronic disease should occur during this time span, the number would approximate 1,350 deaths. This argument, while logical, will not allow a conclusion, because there are factors which have not been evaluated. However, the sample, plus logic, does indicate that it is necessary to attempt to lessen the influence of physiological conditions of drivers in automobile deaths.

Responsibility of the Medical Profession

It is my opinion that the most effective approach to this is through active, planned use of methods available only to the medical profession. It is also my opinion that the medical profession is presently unaware of the significance of this aspect of the problem and consequently is not taking active or planned curative action.

For example: how many doctors, when diagnosing hypertension, recommend relaxation through an automobile trip down crowded highways? How many depressant or stimulating drugs are administered without restriction being placed on the patient's driving? How many patients with cardiac problems are cautioned about the strain involved in driving at high speeds on crowded freeways? How many persons suffering from diabetes are, because of sugar imbalance, exposing other motorists and themselves to destruction?

Another small sampling was recently conducted which may lead to an inference in this regard. One hundred convicted drunken drivers were asked if they had discussed with a physician their problem of drinking and driving. Out of the 100, only 7 had discussed with a doctor their excessive drinking and, in these 7 instances, the problem of their drinking as it affected their driving was not mentioned.

Conclusions

The preceding information results in the following conclusions: The most effective method of treatment of the problem of automobile deaths and injuries is attacking the basic causes, thereby effecting a reduction in the number of accidents. Basic causes are existing mental and physiological conditions of drivers which dictate such behavior as speeding or reckless driving. Planned action cannot be effectively taken unless facts are gathered by joint research teams composed of representatives of the medical profession and existing accident-prevention agencies. Unless these steps are taken, 10 years from today we will have investigated and analyzed 15 million more accidents and still be forced to admit that we know very little about the basic causes of those accidents.

P. O. Box 898 (4).

INFLUENCE OF CHLOROTHIAZIDE ON WATER AND ELECTROLYTE EXCRETION IN PREECLAMPSIA

Russell R. de Alvarez, M.D.
and
John M. O'Lane, M.D., Seattle

The mechanism of the diuresis provoked by chlorothiazide was studied in 14 women hospitalized for toxemia of pregnancy. They received 500 mg. of chlorothiazide orally twice a day in addition to a well-established basic treatment for toxemia, and the results were compared with those in a group of 23 patients who received the basic treatment without the chlorothiazide. It was also possible to compare two-day periods in which the drug was given with two-day periods in which it was withheld. While the drug did not cause any consistent changes in the urinary pH, titratable acidity, mean urinary ammonia level, serum carbon dioxide content, serum sodium level, serum potassium level, serum chloride level, or patient's body weight, it did cause a marked increase in the urinary excretion of sodium, potassium, and chloride. Chlorothiazide in vitro strongly inhibits carbonic anhydrase, but its action under the conditions described in patients with preeclampsia differed from that of other carbonic anhydrase-inhibiting diuretics and also from that of mercurial diuretics.

It has long been a goal of research scientists to develop a diuretic drug which would be effective on oral administration and which would not produce serious electrolyte imbalance. Recently, chlorothiazide (Diuril), a new diuretic agent, has shown considerable promise in animal experiments. Chemically, chlorothiazide is 6-chloro-7-sulfamyl-1, 2, 4-benzothiadiazine-1, 1-dioxide.[1] Its structure is represented in figure 1. This compound is structurally related to some carbonic anhydrase-inhibiting diuretics, in that it contains a sulfamyl group attached to a benzene ring.

Preclinical experiments indicate that this compound possesses a high degree of activity as an inhibitor of carbonic anhydrase in vitro.[2] It is considered to be about 10 to 30 times as potent as sulfanilamide in this respect. In animals, chlorothiazide causes a marked increase in the urinary excretion of sodium, potassium, chloride, and water.[3] Excreted sodium is matched approximately mol for mol by chloride ions.[2] This effect is similar to that of mercurial diuretics, although chlorothiazide does not contain mercury. At high doses, bicarbonate excretion takes place, presumably because of inhibition of carbonic anhydrase. Because chlorothiazide is an effective diuretic in dogs at doses which do not produce bicarbonate excretion, these animal experiments suggest that its mechanism of action cannot be explained on the basis of carbonic anhydrase inhibition. Since the mechanism of this agent is still doubtful, we were particularly interested to investigate both the clinical effectiveness and the mechanism of action of chlorothiazide in some of the abnormalities of human pregnancy.

Materials and Methods

All patients diagnosed as having toxemia of pregnancy who were admitted to the obstetrics and gynecology service of King County Hospital during a period limited to the study of chlorothiazide were included in this study, with the exception of those patients who left the hospital against medical advice before the experimental period had elapsed. All patients were hospitalized during the period of investigation. The final diagnosis of toxemia was based on information obtained during the antepartum period, the period of hospitalization, and the follow-up period, at least three months post partum. The series consisted of a total of 14 women, 9 Caucasian, 3 Negro, and 2 American Indian, who were investigated during the immediate postpartum period in the hospital. This group of patients lent itself to comparison with another group of similar patients with toxemia of pregnancy previously studied in the same manner, with the exception that no diuretic drug was administered. In this controlled study of hospitalized patients we were able to investigate extensively many factors bearing on the course of toxemia of pregnancy and to analyze the effect of chlorothiazide in modifying those factors.

Each patient was studied over a seven-day period. Bed rest was enforced for the first three days, after which the majority of patients were made ambulant. A food intake consisting of a 1,200-calorie, neutral-ash, low-salt diet, containing approximately 30 mEq. of sodium daily, was maintained unless the patient was unable to tolerate oral feedings, in which case intravenous feedings were

---

From the Department of Obstetrics and Gynecology, University of Washington School of Medicine and Hospitals.

carried out. Food trays were weighed before and after each meal, and the actual daily intake of sodium, calories, acid, and basic ash was calculated. Sedation in varying degrees depending on the severity of the toxemia was prescribed as appropriate. All urine was collected as 24-hour specimens and kept under 25 ml. of mineral oil in order to prevent alterations in chemical values because of exposure to air. To prevent contamination by lochia, the urine from all postpartum patients was collected through indwelling Foley catheters.

The foregoing general measures constitute the general toxemia regimen of the department of obstetrics and gynecology of the University of Washington and have been kept constant for several years. The only modification from the usual program was the addition of 500 mg. of chlorothiazide given orally twice a day in the experimental group. Patients in the control group received no diuretic agents. During the first 24 hours of hospitalization no chlorothiazide was administered. On the second and third postpartum days, 500 mg. of chlorothiazide was given twice daily. During the fourth and fifth postpartum days, no chlorothiazide was given. On the sixth and seventh days the drug was again administered in the same dosage.

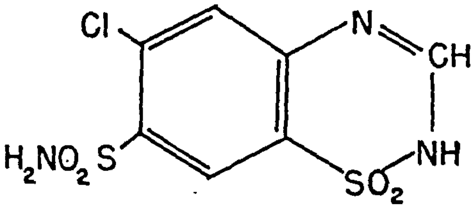


Fig. 1.—Chemical structure of chlorothiazide.

Serum sodium, potassium, and chloride levels were determined daily. On the second, fourth, and sixth hospital days blood urea nitrogen level, total protein level, albumin-globulin ratio, and fibrinogen and serum carbon dioxide levels were measured. On each of the daily 24-hour urine samples, urine pH, total volume, albumin level, specific gravity, ammonia content, titratable acidity, and sodium, potassium, and chloride levels were determined. The weight of each patient in grams was determined daily at the same time by the same person on a specially constructed scale for bedside weighing. The weights were accurate to 10 Gm. Blood pressure and edema were evaluated daily by the same person.

Sodium and potassium levels were determined by a flame photometer method with use of the Baird spectrophotometer. The chloride level was determined by the method of Schales and Schales,[4] blood urea nitrogen level by a slight modification of the method of Van Slyke and Cope,[5] carbon dioxide content by a slight modification of the method of Van Slyke and Neill,[6] titratable acidity by the method outlined by Hawk and co-workers,[7] ammonia by a slight modification of the method of Van Slyke and Cullen,[8] and pH with the Beckman, model G, pH meter.

All data were submitted to statistical analysis to determine the effect of chlorothiazide on the course of toxemia of pregnancy in the postpartum period. Since most reports attach great significance to the day-to-day changes occurring after the administration of a given drug, we considered it highly important to determine whether such changes would occur in a group of patients similarly treated except for the use of the drug. The fact that untreated patients may exhibit statistically significant changes from day to day makes it imperative that observations be made in a control group if the effect of a drug is to be properly evaluated. It is incorrect to ascribe to the action of a drug the finding of a significant difference until control studies have been performed. The failure to observe this principle has led to much confusion and misinformation in the past.

The Student's *t* test[9] was used to compare means in the chlorothiazide and control groups on a day-for-day basis. The reproducibility of the individual determinations was considered in establishing the p values on levels thought to be significant. In general, those observations having a low coefficient of variation, such as on the serum electrolytes, were considered significant at a level of $p=0.01$. For observations having a high coefficient of variation, as on the urine electrolytes and weight gain, the level of significance was established at $p=0.05$.

Results

The results obtained in this study in the 14 postpartum patients with toxemia of pregnancy who were treated with chlorothiazide are summarized in table 1. The results obtained in the group of 23 patients with toxemia of pregnancy studied in the postpartum period who did not receive any diuretic drugs are summarized in table 2. The latter group will be referred to as the control group.

Urine Sodium.—As shown in table 1, the urine sodium excretion remained constant during the first three days, being 73.2 mEq. per 24 hours the first (no drug) day and 70.7 and 75.9 on the second and third postpartum days, which were the first two days that the drug was given. Thus, the patients treated with chlorothiazide did not experience the drop in sodium excretion that the control group did (fig. 2). Significant increases of sodium excretion were found on the second day of the first course of drug administration (control group 47.3 mEq. per 24 hours, chlorothiazide group 75.9 mEq. per 24 hours: $p=0.05$) and on both days of the second course (control group 23.6 mEq. per 24 hours, chlorothiazide group 59.7 mEq. per 24 hours: $p=$

0.002; control group 28.0 mEq. per 24 hours, chlorothiazide group 66.2 mEq. per 24 hours: p=0.005). On the fourth and fifth days, on which no drug was given, the chlorothiazide group excreted significantly less sodium than the control group (control group 59.1 mEq. per 24 hours, chlorothiazide group 31.6 mEq. per 24 hours: p=0.04; control group 42.6 mEq. per 24 hours, chlorothiazide group 28.9 mEq. per 24 hours: p=0.05). The level of significance for this determination was established at p=0.05.

TABLE 1.—*Data in Postpartum Patients with Toxemia of Pregnancy Treated with Chlorothiazide*

	Day of Treatment*																				
	1			2†			3†			4			5			6†			7†		
	No.	Mean	S.D	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.
Sodium excretion, mEq./24 hr.	10	73.2	61.6	9	70.7	44.9	10	75.9	32.1	9	31.6	28.8	10	28.9	24.4	10	59.7	34.5	10	66.2	40.7
Potassium excretion, mEq./24 hr.	10	53.4	15.0	11	89.3	37.8	12	92.8	23.0	10	64.2	23.8	12	69.1	24.0	10	81.9	26.2	10	90.4	33.0
Chloride excretion, mEq./24 hr.	9	52.9	28.7	11	129.1	74.1	12	107.4	75.4	10	33.3	21.1	11	25.1	20.5	10	53.2	30.4	10	59.2	32.0
Serum sodium level, mEq./liter	..	...	...	10	136.2	2.78	12	135.5	3.47	12	135.3	3.82	11	138.2	2.71	10	137.2	3.08	10	136.2	2.93
Serum potassium level, mEq./liter	..	...	...	11	4.59	0.661	12	4.38	0.371	12	4.49	0.485	12	4.44	0.513	10	4.75	0.610	10	4.45	0.492
Serum chloride level, mEq./liter	.	...	...	11	101.1	3.67	11	98.0	2.64	12	97.7	3.60	12	97.7	3.93	10	99.1	3.92	10	97.4	1.98
Weight loss, kg./24 hr.	..	...	...	10	0.27‡	0.61	11	0.55	0.90	12	1.25	1.38	11	0.08	0.68	9	0.56‡	0.38	9	0.50	0.41
Urine titratable acidity, mEq./24 hr.	10	30.3	10.2	11	28.6	13.4	12	27.7	8.0	12	30.1	13.9	12	29.4	15.7	10	24.7	9.1	10	29.0	13.8
Urine ammonia level, mEq./24 hr.	8	46.9	16.8	11	57.4	34.3	12	71.0	37.6	12	57.4	23.2	11	73.2	20.3	8	55.5	14.0	10	83.2	42.0
Urine pH	10	6.11	0.66	11	6.40	0.50	12	6.40	0.30	12	6.24	0.49	12	6.24	0.85	10	6.40	0.48	10	6.27	0.81
Serum carbon dioxide content, mEq./liter	..	...	...	10	23.1‡	3.6	..	...	...	11	23.3	4.4	..	...	...	9	24.3‡	3.6	..	...	...

* No.=number of patients; S.D.=standard deviation.
† Chlorothiazide, 1,000 mg.
‡ Determined prior to drug administration.

Urine Potassium.—In the chlorothiazide group the urine potassium excretion increased during the administration of chlorothiazide and decreased when the drug was withdrawn. In general, the changes were more pronounced quantitatively than those of urine sodium excretion. When the chlorothiazide group was compared to the control group it was found that, in contrast to findings on urine sodium, a statistically significant increase in excretion of urinary potassium occurred on each day of both the first drug period (control group 56.2 mEq. per 24 hours, chlorothiazide group 89.3 mEq. per 24 hours: p=0.004; control group 50.0 mEq. per 24 hours, chlorothiazide group 92.8 mEq. per 24 hours: p=<0.001) and the second drug period (control group 54.5 mEq. per 24 hours, chlorothiazide group 81.9 mEq. per 24 hours: p=0.005; control group 45.9 mEq. per 24 hours, chlorothiazide group 90.4 mEq. per 24 hours: p=0.001), as illustrated in figure 3. The statistical level of significance for this determination was established at p=0.05.

TABLE 2.—*Data in Postpartum Patients with Toxemia of Pregnancy Not Treated with Chlorothiazide*

	Day*																				
	1			2			3			4			5			6			7		
	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.
Sodium excretion, mEq./24 hr.	18	92.8	55.2	21	69.2	44.0	21	47.3	29.2	22	59.1	40.0	20	42.6	18.4	12	23.6	10.8	15	28.0	12.4
Potassium excretion, mEq./24 hr.	18	61.52	44.1	21	56.2	28.5	21	50.0	14.9	23	51.7	47.6	18	60.6	27.4	14	54.5	20.3	14	45.9	21.1
Chloride excretion, mEq./24 hr.	17	124.0	85.6	19	77.4	31.6	21	51.0	25.8	23	50.5	36.1	19	47.7	21.5	15	43.8	28.4	15	35.8	21.0
Serum sodium level, mEq./liter	21	140.2	5.66	17	139.2	5.93	20	137.7	5.50	19	141.2	4.84	21	141.0	5.96	18	140.7	5.85	17	142.6	5.01
Serum potassium level, mEq./liter	22	4.27	0.585	19	4.37	0.510	20	4.38	0.503	19	4.56	0.746	21	4.49	0.605	17	4.34	0.675	18	4.50	0.576
Serum chloride level, mEq./24 hr.	20	101.5	1.71	20	99.5	5.49	20	97.8	7.05	18	98.1	7.26	22	98.4	5.72	17	99.0	4.94	17	101.9	7.63
Weight loss, kg./24 hr.	..	...	...	17	0.79	1.03	19	0.54	1.05	21	0.55	0.77	21	0.59	0.61	21	0.53	0.60	23	0.64	0.69

* No.=number of patients; S.D.=standard deviation.

Urine Chloride.—Mean urine chloride excretion rose sharply from that of the control group during the first course of chlorothiazide therapy, as shown in figure 4 (first drug day: control group 77.4 mEq. per 24 hours, chlorothiazide group 129.1 mEq. per 24 hours: p=0.007, second drug day: control group 51.0 mEq. per 24 hours, chlorothiazide group 107.4 mEq. per 24 hours: p=<0.001). The chloride excretion rose from 52.9 mEq. per 24 hours on the first (no drug) day to 129.1 mEq. per 24 hours on the first day of drug administration. As was also noted for the urine sodium excretion, the excretion rate of chloride fell below the control values on the rest days (days four and five) after the first course of chlorothiazide therapy. This decrease was statistically significant on the fifth day (fourth day: control group 50.5 mEq. per 24 hours, chlorothiazide group 33.3 mEq. per 24 hours: p=0.10; fifth day: control group 47.7 mEq. per 24 hours, chlorothiazide group 25.1 mEq. per 24 hours: p=0.005).

During the second course of chlorothiazide therapy the chloride excretion rate was markedly reduced and was significantly increased from that of the control group only on the second, or seventh postpartum, day (control 35.8 mEq. per 24 hours, chlorothiazide group 59.2 mEq. per 24 hours: p=0.02). The statistical level of significance for this determination was established at p=0.05.

Urine pH.—The urine pH showed no consistent pattern of change. The lowest mean value was 6.11 and the highest 6.40. No significant changes from day to day in mean pH were detected. In fact, on each day certain patients' urine pH went up slightly while that of other patients went down slightly. The level of significance for this determination was set at p=0.01.

Titratable Acidity.—Urinary titratable acidity varied from 27.7 mEq. per 24 hours to 30.3 mEq. per 24 hours during the seven days of observation. With the level of significance set at p=0.01, no significant differences from day to day in mean titratable acidity were noted. As in the pH determination, some patients had slight increases in titratable acidity and others slight decreases on the same day. No consistent pattern of titratable acidity change with drug administration could be made out.

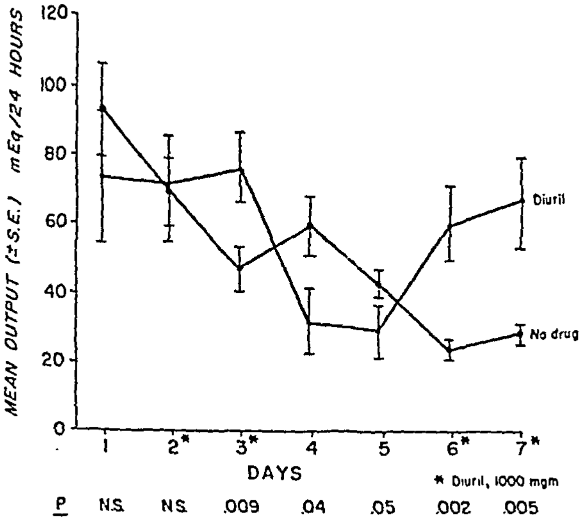


Fig. 2.—Increased urine sodium excretion in postpartum patients with toxemia of pregnancy treated with chlorothiazide over that of similar patients given no drug.

Urine Ammonia.—Mean urine ammonia level varied from 46.9 mEq. per 24 hours to 83.2 mEq. per 24 hours during the seven days of observation. With the level of significance set at p=0.01, no significant differences from day to day were noted. On the second day (first drug day) and the fifth day (second day of the rest period), increases in urine ammonia levels which might be labeled "almost significant" occurred (first drug day p=0.02; second rest day p=0.03). Since these increases in urine ammonia levels were observed both when the drug was given (second day) and when the drug was withheld (fifth day), it is difficult to attach much importance to this finding. On neither of these days was enough change seen to be considered statistically significant, and, therefore, we ascribe the changes on the first drug day and the second rest day to chance.

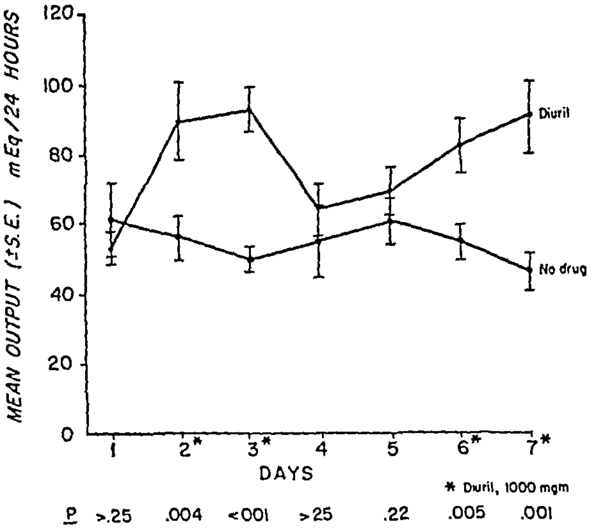


Fig. 3.—Increased potassium urine excretion in postpartum patients with toxemia of pregnancy treated with chlorothiazide over that of similar patients given no drug.

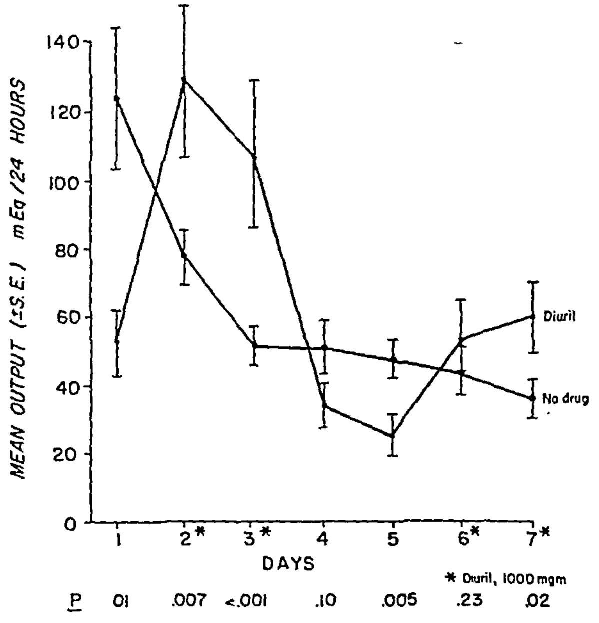


Fig. 4.—Increased urine chloride excretion, on three of four days that chlorothiazide was given, in postpartum patients with toxemia of pregnancy.

Serum Carbon Dioxide.—The serum carbon dioxide content did not change significantly from day to day during the administration of chlorothiazide.

Mean values were 23.1, 23.3, and 24.3 mEq. per liter respectively. The statistical level of significance for this determination was set at p=0.01.

Serum Sodium.—The mean serum sodium values for the chlorothiazide group and the control group are shown in figure 5. It is seen that on the second day of drug administration essentially no change in serum sodium levels occurred. The mean value for the chlorothiazide group was 135.5 mEq. per liter on the first drug day, changing to 135.3 mEq. per liter on the second drug day (the third day of observation). The control group, however, experienced an increase on the corresponding day from 137.7 to 141.2 mEq. per liter. The change in serum sodium levels exhibited by the control group constituted a significant difference, compared to the change exhibited by the chlorothiazide group (p=0.001). Thus, on the second day of drug administration the serum sodium levels in the drug group were not seen to have the same increase as in the control group. Similarly, on the second day of administration of chlorothiazide in the second course of therapy the chlorothiazide group did not show a corresponding elevation of serum sodium levels when compared with the control group (control 142.6 mEq. per liter, chlorothiazide group 136.2 mEq. per liter: p=0.001).

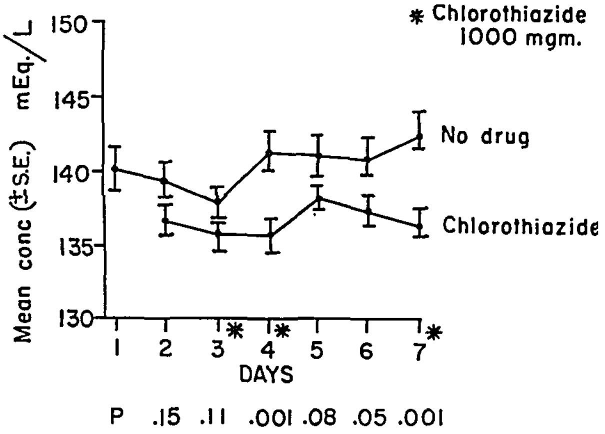


Fig. 5.—Serum sodium levels in postpartum patients with toxemia of pregnancy. Since blood specimens were obtained on days two and six before drug was administered, effect of chlorothiazide on serum sodium is reflected in values for days three, four, and seven. Note that mean serum sodium level of chlorothiazide group was not elevated on days four and seven.

Serum Potassium.—The mean serum potassium level varied from a low of 4.38 to a high of 4.75 mEq. per liter during the seven-day period of observation. No statistically significant variation in the serum potassium level was detected through the course of this study. The statistical level of significance for this determination was set at p=0.01.

Serum Chloride.—The serum chloride level varied from a low of 97.4 mEq. per liter to a high of 101.1 mEq. per liter. The statistical level of significance for this determination was set at p=0.01. No significant changes in the level of serum chloride were found.

Patients' Weight.—Weight changes of the chlorothiazide patients were not impressive when compared with those of the control group (fig. 6). The only day in which the drug group lost significantly more weight than the control group was on the second drug day (control 0.55 kg. [1⅛ lb.], chlorothiazide group 1.25 kg. [3 lb.]: p=0.04). On the following day (the first rest day) the control group lost significantly more than the drug group (control 0.59 [1⅙ lb.], chlorothiazide group 0.08 kg. [⅙ lb.]: p=0.025). While the average for all patients in the drug group was a net loss in weight each day, there actually were several cases in which patients gained weight while receiving chlorothiazide.

Toxicity.—In one patient who had bleeding during the third trimester, administration of the initial dose of chlorothiazide was followed by shock with increased pulse rate, decreased blood pressure, and pronounced diaphoresis. After blood transfusion, the patient improved; on subsequent delivery a partial abruption of the placenta was demonstrated. It is believed that her symptoms of shock could be considered as secondary to the abruption of the placenta and not secondary to the administration of chlorothiazide. No definitely related instances of toxicity of any sort were noted during the course of the study.

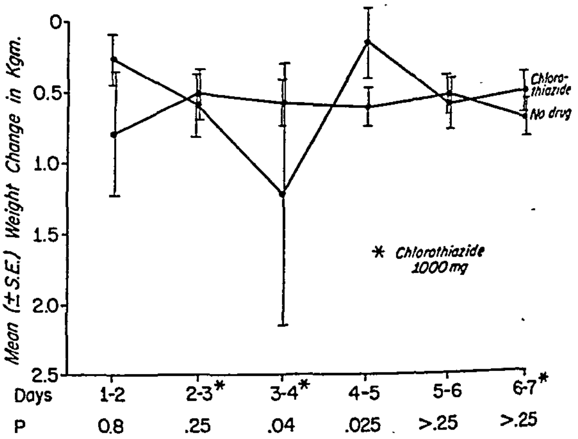


Fig. 6.—Weight change in chlorothiazide and control groups, showing loss of approximately same amount of weight during period of investigation.

Comment

Chlorothiazide, when administered in the postpartum period to patients with toxemia of pregnancy in doses of 500 mg. twice a day, produced the following effects:

The urinary excretion of sodium, potassium, and chloride was markedly increased. Urine pH, titratable acidity, and ammonia levels were not changed significantly.

Serum chloride, potassium, and carbon dioxide levels were not significantly altered. The serum sodium level of these patients failed to show the control pattern of increase when chlorothiazide was given.

It is interesting that the chlorothiazide group excreted significantly less sodium in the urine than the control group during the fourth and fifth days of the study, on which no chlorothiazide was given. While one might have expected the urine sodium level to drop to the control level when chlorothiazide therapy was discontinued, it does seem surprising that the level of sodium excretion should actually drop below that of the control group. The mechanism of such a change is not clear, especially in view of the finding that the serum sodium level was not altered significantly during this period. One might postulate that, since the drug group lost more sodium early in the experimental period because of the administration of chlorothiazide, an increased reabsorption of sodium occurred when the drug was withdrawn. The exact mechanism through which this increased reabsorption was accomplished remains to be determined. If chlorothiazide acts by blocking a normal renal mechanism for sodium reabsorption, the withdrawal of the drug could permit the "unblocking" of that mechanism with a subsequent decrease in urine sodium excretion. When the experimental group was compared with the control group, the urine potassium level was significantly increased during each day of drug administration.

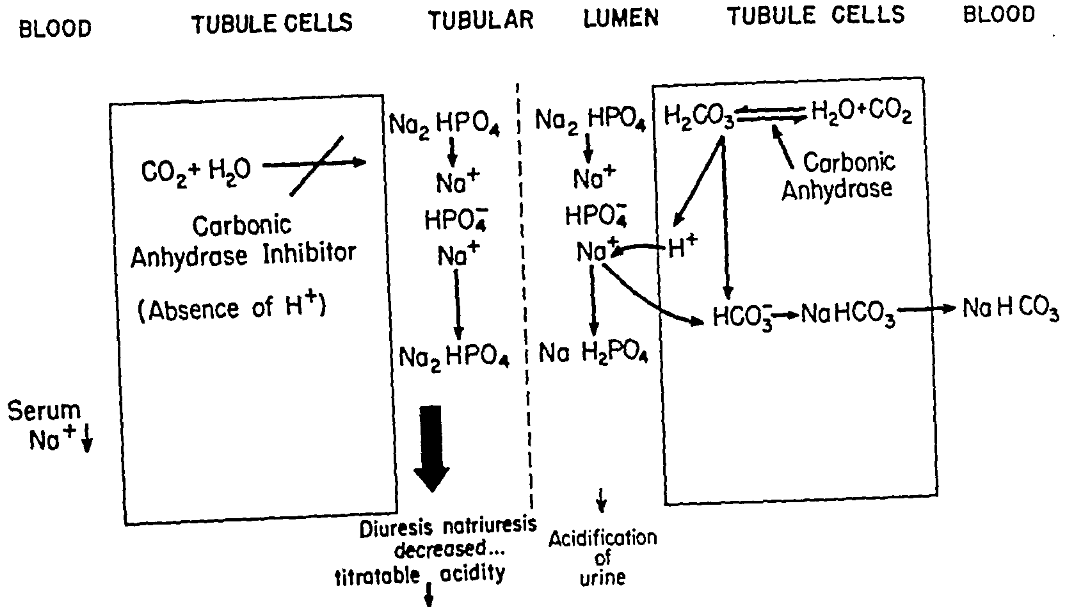


Fig. 7.—How inhibition of carbonic anhydrase decreases urine acidification.

It now seems well established that almost all of the potassium found in the urine results from an exchange with sodium in the distal convoluted tubule. Apparently that potassium which is filtered through the glomerulus is almost entirely reabsorbed in the proximal tubule. It follows, therefore, that any process which increases the sodium concentration in the distal tubule will enhance the excretion of potassium. In the distal tubule, both potassium and hydrogen ions within the tubule cell are exchanged for tubular sodium. Therefore, a process reducing the available hydrogen ion within the tubule cell would enhance potassium excretion, as occurs with carbonic anhydrase inhibitors. One can see that potassium excretion is affected by several varying processes; therefore, it is difficult to draw conclusions as to possible mechanisms of drug action from changes in the level of urine potassium.

The acidification of urine is dependent on the enzyme carbonic anhydrase. Its mechanism of action may be depicted as follows: In the renal tubule cells carbon dioxide from internal metabolism is combined with water to form carbonic acid which dissociates into hydrogen ions and bicarbonate ions. The hydrogen ions then pass across the cell membrane into the lumen of the tubule where they replace basic ions (for example, sodium) in the urine. This mechanism results in a conservation of the fixed basic ions of the body and in their replacement by hydrogen ions in the urine (fig. 7).

The urine pH may be considered as a measure of carbonic anhydrase activity in the kidney. As urinary acidification occurs, the pH of the urine should decrease. Therefore, a carbonic anhydrase inhibitor should cause an increase in the urine pH, because it reduces urinary acidification by blocking the formation of carbonic acid from carbon dioxide in the tubule cell. In animal experiments[10] no instance of the pH rising above 7.0 was observed when single doses of chlorothiazide were given. It has been reported[11] that large doses of chlorothiazide in man cause an increase in urinary pH but as dosage is reduced the urine becomes more acid, because the chloruretic effect persists in the face of a decreased bicarbonate excreting power. In some of our patients, the urine was alkaline. However, no statistically significant change in urine pH was demonstrated. This is an indication that, in the clinically effective doses used in this study, no measurable carbonic anhydrase inhibitory activity is detectable.

If chlorothiazide is an effective inhibitor of carbonic anhydrase activity, one would expect the titratable acidity to fall during the administration of the drug and to rise after its withdrawal, as is observed with classic carbonic anhydrase inhibitors. No such change was detected, indicating that carbonic anhydrase inhibition did not occur in our patients.

The measurement of urine ammonia level provides another indication of carbonic anhydrase activity. Glutamine is acted on in the renal tubule cell to give glutamic acid, plus ammonia, through the action of the enzyme glutaminase. The ammonia combines with hydrogen ions from the carbonic acid reaction to produce ammonium ions, which diffuse into the urine and replace basic cations (fig. 8).Of course, the urine ammonia determination may not be considered as specific a test for carbonic anhydrase function as those for pH and titratable acidity because, in addition to depending on available hydrogen ions, the urine ammonia level also depends on a functioning glutaminase and on urine pH. As the patient's nitrogen intake is held relatively constant, inhibition of carbonic anhydrase by chlorothiazide should be reflected by decreased urine ammonia levels during periods of drug administration. No such decrease was observed. The observation that there was no significant change in urine ammonia levels may be interpreted best as an indication that no dysfunction of either the glutaminase or carbonic anhydrase systems occurred as a result of chlorothiazide therapy. This agrees with and lends support to the finding that there is no significant change in titratable acidity and pH and is strong evidence that no inhibition of carbonic anhydrase activity occurred in our patients.

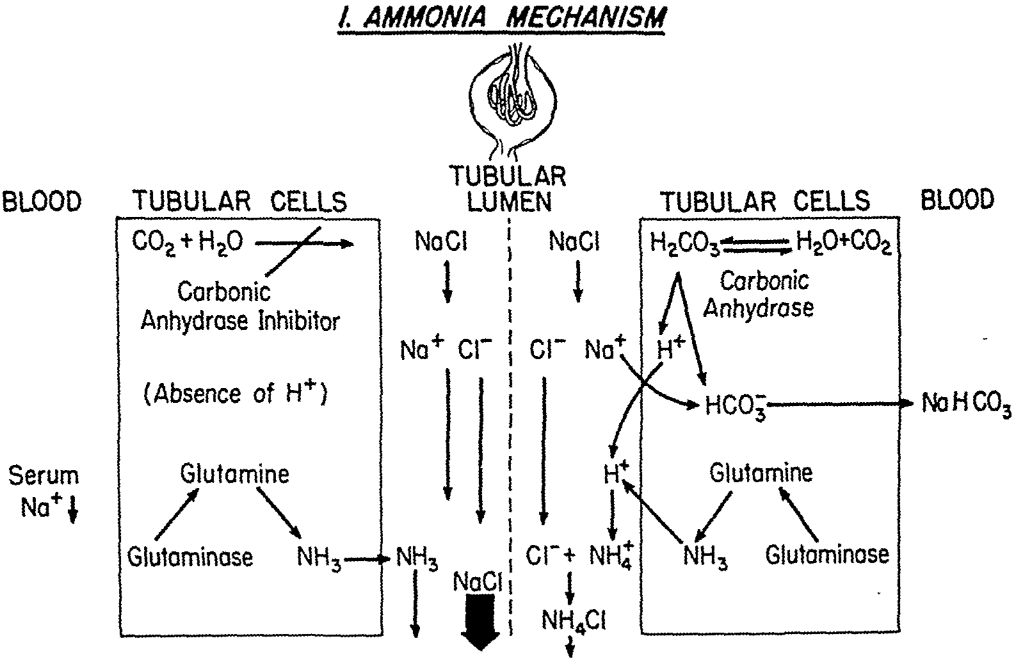


Fig. 8.—Interaction of carbonic anhydrase and glutaminase systems in reabsorption of urine sodium.

The carbon dioxide content did not change significantly during the administration of chlorothiazide. The classic carbonic anhydrase inhibitor type of diuretic produces a state of metabolic acidosis after a day or two of administration. This may be explained on the basis of the electrolyte excretion pattern. Thus, sodium, potassium, and bicarbonate are excreted in large amounts, while almost no hydrogen ion is excreted. This means that there is a net loss of basic cations (sodium and potassium) with the production of hyponatremic, hypokalemic, metabolic acidosis. The serum carbon dioxide level is, therefore, markedly reduced.

The fact that no significant reduction in serum carbon dioxide content was observed indicates that acidosis was not evident in our patients with the doses used in our study. This observation provides evidence that carbonic anhydrase inhibition does not explain the mechanism of action of chlorothiazide. Neither is this action similar to that of mercurial diuretics. These agents characteristically cause hypochloremic metabolic alkalosis with a compensatory increase in serum carbon dioxide level. In its effects on serum carbon dioxide, chlorothiazide differs from both of these groups of diuretics.

Some cardiac patients have been reported to exhibit signs and symptoms of low serum sodium levels after administration of chlorothiazide.[10] This was observed in one of our patients with chronic renal disease, diagnosed as diabetic glomerulosclerosis after renal biopsy. No other patient exhibited an unusually low serum sodium level.

Comparison of Chlorothiazide with Carbonic Anhydrase Inhibitors.—When compared with carbonic anhydrase inhibitors, chlorothiazide exhibits striking differences, as shown in figure 9. Carbonic anhydrase inhibitors characteristically produce an increase in urine pH and a decrease in urine titratable acidity and ammonia level. These changes were not observed during the administration of chlorothiazide. Chlorothiazide is similar to carbonic anhydrase inhibitors in that both agents produce increased urinary excretion of sodium and potassium. While carbonic anhydrase inhibitors cause little change in chloride excretion, chlorothiazide results in a markedly increased excretion of chloride. Carbonic anhydrase inhibitors tend to lower serum sodium and potassium levels. This did not occur in the chlorothiazide group. However, a rise in serum sodium level which occurred in our untreated, control patients did not occur in the chlorothiazide group. Finally, carbonic anhydrase inhibitors cause metabolic acidosis, as determined by low serum carbon dioxide content; in our hands chlorothiazide caused no acid-base imbalance, and the serum carbon dioxide content was not significantly changed. At the doses used the carbonic anhydrase inhibitory properties of chlorothiazide demonstrable in vitro were not observed in vivo.

Animal experiments reported by Ford and others[11] have indicated that the diuresis mechanism of chlorothiazide is different from that of the classic carbonic anhydrase inhibitor acetazolamide. Apparently, the carbonic anhydrase-inhibiting properties which are demonstrable in vitro are not responsible for the diuretic effect, for, unlike acetazolamide, chlorothiazide causes (in animals) the excretion of similar amounts of sodium and chloride. It does not result in acidosis and does not lose its effectiveness if given on successive days. In general, our results in women with toxemia of pregnancy confirm those found by Ford and Spurr in their animal experiments.

It is important to consider that the statements made about lack of carbonic anhydrase inhibition apply to the dosage schedule used in our study. Perhaps at a higher dosage level or with prolongation of administration carbonic anhydrase inhibition might manifest itself, causing a much different excretion of electrolytes.

Additional evidence for a different mechanism of action between chlorothiazide and carbonic anhydrase inhibitors is provided by the studies of Finnerty and associates[12] on patients with toxemia of pregnancy. Their results, based on weight losses without electrolyte studies in clinic outpatients, showed a potentiation of acetazolamide diuresis when chlorothiazide was administered. The foregoing evidence, both from the literature and from our own studies, seems to indicate conclusively that chlorothiazide acts through some mechanism other than inhibition of the enzyme carbonic anhydrase.

	NON-PREGNANT			TOXEMIA OF PREGNANCY			
				CHLOROTHIAZIDE			
	C.A.I.	Hg	Cl ⊖	1st Course		2nd Course	
				1st day	2nd day	1st day	2nd day
Urine Na	↑	↑↑	↑↑	—	↑↑	↑↑	↑↑
" K	↑↑	—	↑↑	↑↑	↑↑	↑↑	↑↑
" Cl	—	↑↑	↑↑	↑↑	↑↑	—	↑
" pH	↑	↓ (?)	?	—	—	—	—
" TA	↓	↑ (?)	↑	—	—	—	—
" NH_3	↓	↑ (?)	↓	—	—	—	—
Serum CO_2	↓(acidosis)	↑(alkalosis)	—		—		
" Na	↓	↓or —	↓	—	?*	—	?*
" K	↓	—	↓	—	—	—	—
" Cl	—	↓	↓	—	—	—	—

Fig. 9.—Action of chlorothiazide in toxemia of pregnancy contrasted with that of carbonic anhydrase inhibitors, mercurial diuretics, and chlorothiazide in nonpregnant patients.

Comparison of Chlorothiazide with Mercurial Diuretics.—The electrolyte excretion pattern of sodium and chloride is qualitatively similar with both chlorothiazide and mercurials (fig. 9). Chlorothiazide causes a marked excretion of potassium, which is not observed with mercurials. In the serum, mercurials tend to cause hypochloremia with associated metabolic alkalosis and elevated serum carbon dioxide level. These serum changes were not observed with chlorothiazide.

While the electrolyte excretion pattern of chlorothiazide in the moderate doses used for this study somewhat resembles that of mercurial diuretics, Laragh[13] has cited several reasons to indicate that a different mechanism is involved. The activity of chlorothiazide is neither inhibited nor reversed by dimercaprol. Conditions refractory to mercurials have responded to chlorothiazide, while those refractory to each drug given separately may respond to both drugs given simultaneously. The addition of a second drug for patients already receiving one agent often gives an increased diuresis. Steroid-induced edema is inhibited or reversed by chlorothiazide, while the mercurials are usually ineffective in such cases. Chlorothiazide is effective in hypochloremic alkalosis, while mercurials are not. The addition of ammonium chloride results in a potentiation of mercurial action, while chlorothiazide action is unaffected.

These facts, together with the differences in serum and urine electrolyte balances demonstrated in our study, provide good evidence that chlorothiazide has a different mechanism of action from mercurial diuretics.

Possible Mechanism of Chlorothiazide.—One explanation of the mechanism of chlorothiazide which accounts for the observations made in our study is that the drug in some way inhibits sodium reabsorption in the proximal renal tubule. This would result in the delivery of an increased amount of sodium into the distal renal tubule. The increased sodium level would provide more opportunity for potassium exchange in the distal tubule, leading to an increased excretion of potassium. Because not all of the extra sodium is replaced by potassium, the amount of sodium delivered into the urine would be increased also. Since it is believed that chloride ions follow sodium ions rather passively, with the blocking of sodium reabsorption in the proximal tubule, a larger amount of chloride would flow into the distal tubule. There is no known active mechanism affecting chloride ions in the distal tubule, and the increased amount of chloride is thought to pass into the urine in association with the increased sodium and potassium levels. Thus, increased excretion of sodium, potassium, and chloride could occur on the basis of a blocking of reabsorption of the single ion, sodium.

Conclusions

Chlorothiazide is a potent agent in promoting the excretion of sodium, potassium, and chloride from the body. When it was administered in a dosage of 500 mg. twice daily for two-day periods with a two-day rest period between each course of therapy, no serum electrolyte abnormalities were noted to occur. Despite the pronounced elevation of electrolyte excretion caused by chlorothiazide, patients with toxemia of pregnancy studied during the postpartum period did not lose weight at a significantly faster rate than patients not given the drug. Chlorothiazide is equally effective on readministration after a two-day rest period. No instances of toxicity or undesirable side-effects were noted.

This study was supported, in part, by a grant from the Pacific Northwest Obstetrical and Gynecological Society.

The chlorothiazide used in this study was supplied as Diuril through Dr. John R. Beem of Merck Sharp & Dohme, Division of Merck & Co., Inc., Philadelphia.

We wish to express our appreciation to Miss Gloria E. Bratvold, Research Associate, Miss Janice Ekholm and Miss Donna Simkins for technical assistance, and Miss Ruth Portman for assistance in statistical analysis.

References

1. Novello, F. C., and Sprague, J. M.: Benzothiadiazine Dioxides as Novel Diuretics, Communications to the Editor, J. Am. Chem. Soc. **79:**2028-2029 (April 20) 1957.

2. Beyer, K. H.; Baer, J. E.; Russo, H. F.; and Haimbach, A. S.: Chlorothiazide (6-Chloro-7-Sulfamyl-1,2,4-Benzothiadiazine-1,1-Dioxide): Enhancement of Sodium Chloride Excretion, Fed. Proc. **16:**282 (March) 1957.

3. Ford, R. V.; Moyer, J. H.; Handley, C.; and Spurr, C. L.: Chlorothiazide (Diuril), Orally Effective Non-mercurial Diuretic Agent, M. Rec. & Ann. **51:**376-378 (April) 1957. Ford, R. V.; Moyer, J. H.; and Spurr, C. L.: Clinical and Laboratory Observations on Chlorothiazide (Diuril), A. M. A. Arch. Int. Med. **100:**582-596 (Oct.) 1957. Moyer, J. H.; Ford, R. V.; and Spurr, C. L.: Pharmacodynamics of Chlorothiazide, Orally Effective Non-mercurial Diuretic Agent, Proc. Soc. Exper. Biol. & Med. **95:**529-531 (July) 1957. Reference 2.

4. Schales, O., and Schales, S. S.: Simple and Accurate Method for Determination of Chloride in Biological Fluids, J. Biol. Chem. **140:**879-884 (Sept.) 1941.

5. Van Slyke, D.D., and Cope, C. L.: Simplified Colorimetric Determination of Blood Urea Clearance, Proc. Soc. Exper. Biol. & Med. **29:**1169-1174 (June) 1932.

6. Van Slyke, D. D., and Neill, J. M.: Determination of Gases in Blood and Other Solutions by Vacuum Extraction and Manometric Measurement, J. Biol. Chem. **61:**523-573 (Sept.) 1924.

7. Hawk, P. B.; Oser, B. L.; and Summerson, W. H.: Practical Physiological Chemistry, ed. 12, New York, Blakiston Company (division of McGraw-Hill Book Company, Inc.), 1947.

8. Van Slyke, D. D., and Cullen, G. E.: Permanent Preparation of Urease and Its Use in Determination of Urea, J. Biol. Chem. **19:**211-228, 1914; Determination of Urea by Urease Method, ibid. **24:**117-122, 1916.

9. Snedecor, G. W.: Statistical Methods Applied to Experiments in Agriculture and Biology, ed. 5, Ames, Iowa, Iowa State College Press, 1940.

10. Personal communication to the authors.

11. Ford, R. V., and Spurr, C. L.: Electrolyte Excretion Patterns due to Chlorothiazide, New Orally Effective Diuretic Agent, abstracted, Am. J. Med. **22:**965 (April 20) 1957. Ford, R. V., and others: Choice of Diuretic Agent Based on Pharmacological Principles, J. A. M. A. **166:**129-136 (Jan. 11) 1958.

12. Finnerty, F. A., Jr.; Buchholz, J. H.; and Tuckman, J.: Evaluation of Chlorothiazide (Diuril) in Toxemias of Pregnancy, J. A. M. A. **166:**141-144 (Jan. 11) 1958.

13. Laragh, J. H.; Heinemann, H. O.; and Demartini, F. E.: Effect of Chlorothiazide on Electrolyte Transport in Man, J. A. M. A. **166:**145-152 (Jan. 11) 1958.

PATHOLOGICAL FINDINGS IN JAUNDICE ASSOCIATED WITH IPRONIAZID THERAPY

Hans Popper, M.D., New York

Specimens of liver tissue were studied in 27 patients who had developed jaundice after taking iproniazid in amounts that totaled from 600 to 19,200 mg. over treatment periods ranging from 4 to 126 days. The aim was to define the type of hepatocellular damage associated with the jaundice and to account for the evident lack of relation between the dose of iproniazid and the severity of the hepatic lesions. The biopsy specimens showed severe spotty necrotic hepatitis with or without extensive necrosis: the 16 autopsy specimens showed either acute massive and submissive necrotic hepatitis or subacute hepatitis with massive and submassive collapse. Clinically, the findings were those of diffuse parenchymal liver disease, mostly without fever, commonly with hepatomegaly, and with terminal hepatic coma in the fatal cases. Results of conventional laboratory tests are tabulated. In some cases the jaundice appeared as late as 20 days after the cessation of therapy. Either the iproniazid activated existing subclinical viral hepatitis or else it was able to produce morphologic changes closely resembling those of viral hepatitis. In either case the possibility of inducing an insidious form of liver disease with high mortality should be kept in mind whenever the administration of iproniazid is found necessary.

The evaluation of injurious effects of drugs and chemicals on the liver is frequently difficult. Some of these, e. g., carbon tetrachloride, cause characteristic functional disturbances and structural alterations in the liver of all persons exposed to them. A close relationship between dose and extent of lesion exists, and the changes are reproducible in experimental animals. In contrast, some drugs produce hepatic injury only in some persons exposed to them—in fact, the percentage of those afflicted may be very small, the dose relation is not always evident, and the lesion cannot be produced in animals at will. In such instances, even if the hepatic injury is associated with jaundice, a causal relation between drug intake and liver damage has been recognized only after the observation of a considerable number of similar cases; the mechanism of this injury remains not established. Hepatic injuries of the cholestatic type, occurring after the administration of chlorpromazine, methyltestosterone, norethandrolone, or other drugs,[1] fall into this category.

Iproniazid (Marsilid) phosphate (1-isonicotinyl-2-isopropylhydrazine), an amine oxidase inhibitor initially used in the treatment of tuberculosis,[2] was recently found to be effective in alleviating various mental disorders, particularly depressions.[3] After the widespread use of iproniazid, reports of cases of jaundice have appeared [4] which developed after administration of this drug and may be related to it. The jaundice in iproniazid-treated patients is associated with biochemical evidence of significant hepatocellular injury and, in contrast to the cholestatic type of hepatic damage, the mortality is relatively high. To determine the type of injury and possible causal relation to drug intake, a study was made of the pathological features of biopsy and autopsy specimens of liver of patients who had developed jaundice after administration of iproniazid. An attempt was made to correlate these findings with the clinical manifestations of the hepatic disease and with the dosage of drug administered.

Material and Methods

The study comprised 13 biopsy specimens and 16 autopsy specimens obtained from 27 patients. Of the 23 patients on whom pertinent data are available, 16 were females and 7 males, and their ages ranged from 21 to 82 years. Ten patients were under 50 years of age; five patients each were in their sixth and seventh decades of life, and two patients and one patient in their eighth and ninth decades respectively (table 1). In one instance (case 19) two biopsy specimens were studied, of which the second specimen was taken three months after the first (or one month after subsidence of the jaundice), while in another (case 25) a biopsy and an autopsy specimen were examined which were obtained 23 days apart. Two biopsy and two autopsy specimens (cases 7, 14, 16, and 21) were from patients treated for jaundice at the Mount Sinai Hospital, New York, whereas most of the other specimens were supplied by other hospitals from all sections of the United States.

The clinical and laboratory data reported were secured by analysis of the entries made in questionnaires submitted by Hoffmann-LaRoche, Inc., to the clinicians who attended the patients included in the study. The findings in the biopsy and autopsy specimens of several patients who had received iproniazid, but did not develop jaundice and did not

---

From the Department of Pathology, the Mount Sinai Hospital.

exhibit symptoms of liver disease, were not included in the study, since these specimens did not show structural abnormalities. Moreover, one patient, who under treatment with iproniazid developed jaundice which subsided and on whom a biopsy was performed several months later, was omitted since hepatitis was not evident in the specimen examined. Hematoxylin-eosin stains and, in addition, where possible, reticulum impregnations and chromotrope/aniline blue stains were used to study the sections.

TABLE 1.—*Clinical Data and Iproniazid Intake in Patients with Jaundice*

Case, No.	Age, Yr.	Sex	Total Iproniazid Dose, Mg.	Duration of Treatment, Days	Interval Between Appearance of Jaundice of Jaundice and		Type of Specimen†
					Cessation of Therapy, Days*	Obtaining of Specimen, Days	
1	43	F	9,200	37	0	12	A
2	65	F	2,100	14	0	17	A
3	31	F	4,400	33	—12	12	A
4	57	F	3,150	31	3	11	A
5	21	M	600	4	2	33	B
6	32	M	19,200	118	0	12	A
7	58	F	2,200	36	—3	9	B
8	39	M	12,000	102	0	17	B
9	...	...	3,000	53	...	17	B
10	63	F	4,000	80	0	10	A
11	40	M	5,000	35	6	11	B
12	36	F	4,650	34	—20	13	B
13	29	F	4,500	55	0	10	A
14	71	F	3,050	63	—8	30	A
15	69	F	5,200	90	—6	29	A
16	74	F	1,000	42	0	30	B
17‡	52	F	1,850	10	0	5	B
18	36	F	2,550	44	0	24	B
19A	45	M	1,340	52	0	12	B
19B§	45	M	1,340	52	...	102	B
20	52	F	2,500	72	0	8	B
21	82	F	3,525	126	0	42	A
22	68	F	2,000+	60	0	32	A
23‖	...	...	...	...	...	...	A
24'	...	...	1,800	50	...	7	A
25A	66	M	10,100	101	1	30	B
25B	66	M	10,100	101	...	53	A
26‖	...			...		...	A
27	60	M	11,000	60	0	11	A

* Negative figures indicate number of days medication was discontinued prior to appearance of jaundice.
† A=autopsy; B=biopsy.
‡ This patient died subsequently.
§ Repeat biopsy; jaundice had disappeared.
‖ Data not available.

Results

The cases studied by either biopsy or autopsy can be divided, from the morphologic viewpoint, into several groups.

Biopsy Specimens.—The study of biopsy specimens resulted in a division of the cases into two main groups.

Severe Spotty Necrotic Hepatitis (Cases 9, 11, 12, 16, 17, and 19A): The liver cell plates were interrupted throughout the lobule by necrosis of single cells or small groups of liver cells which were replaced by aggregations of histiocytes and lymphocytes with a varying admixture of segmented leukocytes, some of which were eosinophilic (fig. 1A). The persisting liver cells varied greatly in size and staining qualities. Some were conspicuously enlarged and their cytoplasm was rarefied (ballooned cells); others were smaller and exhibited a dense cytoplasm, while a third type of cell had strongly acidophilic cytoplasm and a pyknotic or broken nucleus. These cells were often expelled from the liver cell plate and were seen as refractile globules in the tissue spaces (acidophilic bodies) (fig. 1*B*).

Other liver cells showed conspicuous evidence of regeneration. The variation in the appearance of the cells in the same area was the outstanding feature of the process. The Kupffer cells were mobilized and contained, as did intralobular macrophages, much brown lipofuscin pigment, apparently derived from liver cell breakdown. The sinusoids were dilated in places but more often they were obstructed by protein debris intermixed with exudate cells. Many bile canaliculi were dilated and contained bile plugs (fig. 1C). Extracellular bile droplets were also seen. The thickened wall of the central vein frequently harbored similar exudate cells. The enlarged and edematous portal tracts

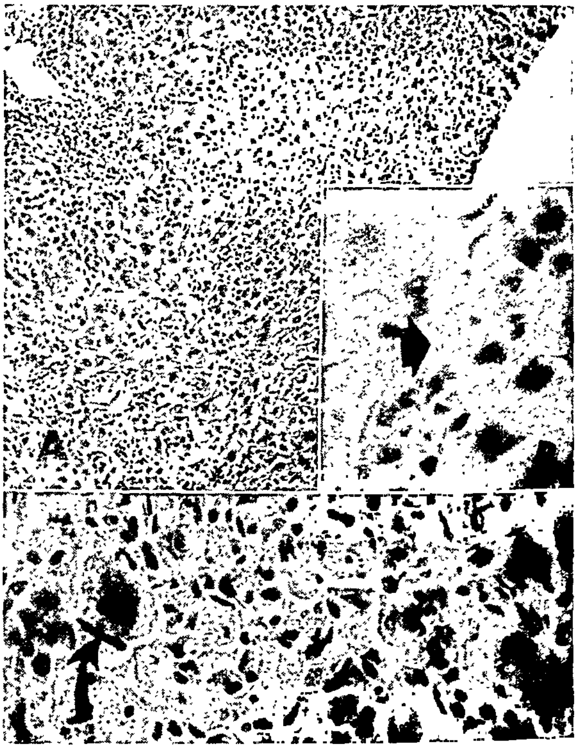


Fig. 1.—Photomicrographs of liver biopsy specimens of patients who developed jaundice after intake of iproniazid (hematoxylin and eosin stain). *A* (case 12), acute spotty necrotic hepatitis with severe interstitial and portal inflammation and regeneration of individual cells (120×). *B*, acidophilic body lying in tissue space containing pyknotic nucleus (*arrow*) (400×). *C*, interstitial accumulation of lymphocytes and macrophages containing lipofuscin around liver cells varying greatly in appearance and bordering on bile plugs in bile capillary (*arrow*) (240×).

exhibited exudate cells—including lipofuscin and bile pigment carrying macrophages. The borders of the portal tracts were obscured by proliferation of ductules, some of which contained bile plugs and exudate cells in their irregularly widened lumens. The duration of jaundice up to the time of biopsy varied in these cases from 5 to 30 days. In one instance a second biopsy after subsidence of jaundice (case 19B) revealed only portal and periportal proliferation of ductules surrounded by fibrosis and exudate cells.

Severe Spotty Necrotic Hepatitis with Extensive Necrosis (cases 7, 20, and 25A): Extensive areas of necrosis were seen in addition to the changes described above. Particularly in the centrolobular zone, liver cells had disappeared from large contiguous areas, and the stroma was collapsed around the persisting mesenchymal elements (fig. 2A). In one patient (case 25A) who subsequently died with subacute hepatitis, the collapse involved whole lobules, the outlines of which were marked by periportal ductular proliferations. The accentuated liver cell breakdown was indicated in all these cases by a very heavy accumulation of lipofuscin both in the Kupffer cells and the macrophages. The jaundice had set in 8 to 30 days before the biopsy was done.

In one instance of mild spotty necrotic hepatitis (case 8), the lesions were similar to those in the first group except that the hepatocellular degeneration, necrosis, and inflammatory reaction were far less severe, although the jaundice was of similar duration. In a subsiding hepatitis (case 5), cellular degeneration and inflammatory lesions in the parenchyma were subdued, while the portal tracts still showed the same pathological picture described above. Lipofuscin pigmentation of the Kupffer cells and regeneratory processes of the liver cells were conspicuous. The total dose of iproniazid administered was the smallest and the duration of therapy the shortest in the entire group. However, this patient had been exposed to cases of jaundice, probably of infectious origin. This raises the question as to whether this patient might not have had infectious hepatitis.

In a case of subacute hepatitis (case 18), the centrolobular zone exhibited severe bile stasis, hepatocellular degeneration, and necrosis (fig. 2B), while in the intermediate zone regeneration with multinucleated giant cells and acidophilic bodies were noted. The portal tracts contained cellular exudate and were fibrotic and connected with each other, producing perilobular fibrosis. The patient had become jaundiced only 24 days before the biopsy was performed.

Autopsy Specimens.—A study of autopsy specimens resulted in a division of the cases into two main groups.

Acute Massive and Submassive Necrotic Hepatitis (cases 1, 3, 6, 10, 13, 24, 26, and 27): In large areas of the liver, all epithelial cells had disappeared in whole lobules or in large parts of them. The framework was either entirely collapsed or was kept still somewhat expanded by erythrocytes which were frequently pooled, or by a mixture of proliferated Kupffer cells with macrophages, both of which contained lipofuscin and occasionally bile pigment. These cells were interspersed to a varying degree with lymphocytes, plasma cells, and neutrophilic and eosinophilic segmented leukocytes (fig. 3A). The reticulum framework itself was intact even where closely approximated. Fragments of the preexisting lobules revealed liver cell plates with dense fat-free cytoplasm. Occasionally, beginning regeneration was indicated by formation of liver cell plates which were several cells thick. On the border of the preserved parts of the parenchyma, the liver cells disintegrated completely, passing through a stage of heavy vacuolization apparently produced by fat deposition; acidophilic bodies were also present. The acuity of the process was indicated by the absence of liver cell breakdown products.

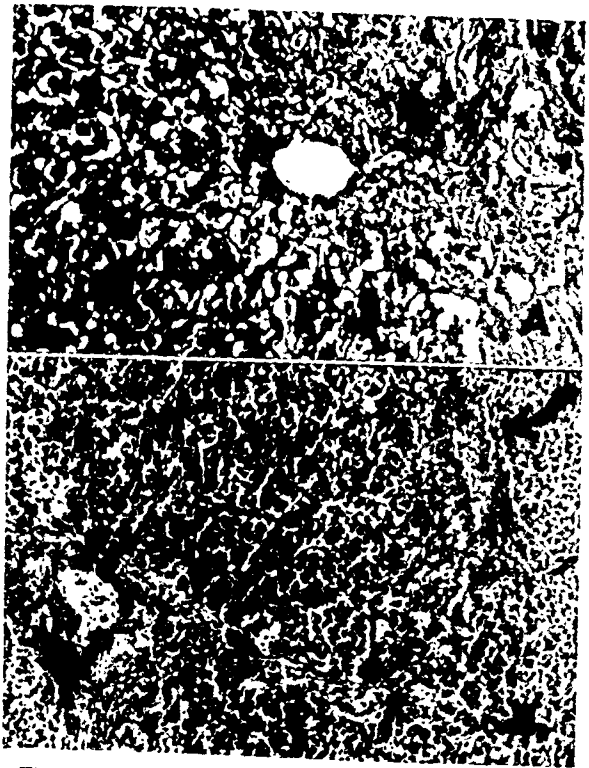


Fig. 2.—Photomicrographs of liver biopsy specimens of patients who developed jaundice after intake of iproniazid (hematoxylin and eosin stain). *A* (case 20), severe spotty necrotic hepatitis with extensive centrolobular necrosis and collapse of framework around central vein (*arrow*) (120×). *B*, (case 18), subacute hepatitis with bile stasis around central vein which exhibits inflammatory infiltration in its wall (*straight arrow*). Perilobular fibrosis (*curved arrow*) connects portal tracts (63×).

Toward the periphery of the lobules many bile ductules, arranged in cords and plates, were lined by irregular epithelial cells which sometimes piled up, formed giant cells, and seemed to be derived from liver cells. The lumens of the ductules contained bile casts and protein-rich exudate intermixed with segmented leukocytes which, with other inflammatory cells, also accumulated around the ductules (fig. 3*B*). These ductular structures indicated the border of the otherwise deepithelialized, collapsed "ghost" lobules. Their center frequently exhibited a thickened hepatic vein branch infiltrated by exudate cells. This apparently fulminant type of hepatic necrosis was observed after 10 to 12 days of jaundice.

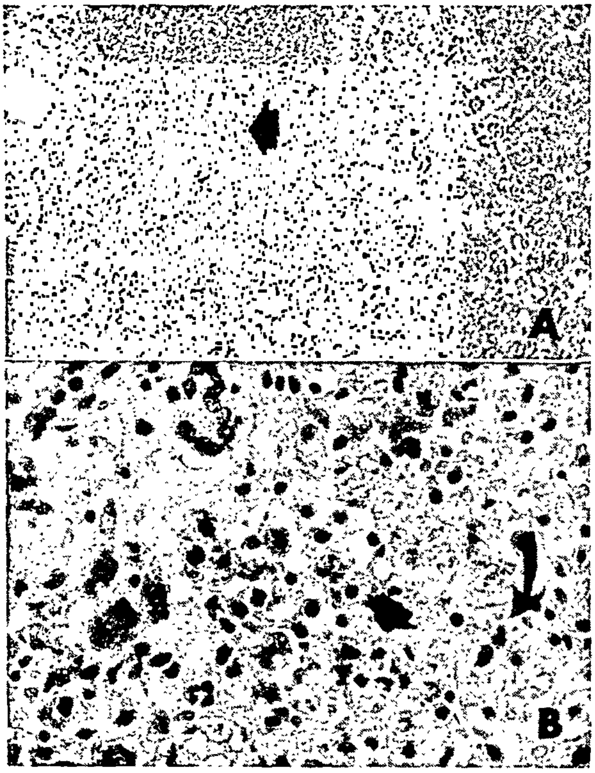


Fig. 3.—Photomicrographs of liver autopsy specimens of patients who developed jaundice after intake of iproniazid. *A* (case 3), fulminant type of massive necrotic hepatitis; collapse and accumulation of red blood cells in central and intermediary zone around hepatic vein branch exhibiting inflammatory infiltration (*arrow*), the periphery of the lobule marked by ductular proliferations (40×). *B*, proliferated ductules and scavenger cells (*straight arrow*) as well as vacuolated degenerating liver cells (*curved arrow*) (240×).

Subacute Hepatitis with Massive and Submassive Collapse (cases 2, 14, 15, 21, 22, and 25B): The lobular architecture, although basically almost always intact, was obscured by degeneration and necrosis, collapse, and regeneration. In the degenerated areas, the cytoplasm of the liver cells was irregular, clumped, bile-pigmented, and vacuolated. Acidophilic bodies were seen in some instances, and the mesenchymal response in three of these cases resembled somewhat that seen around the areas of spotty necrosis in the biopsy material. However, the degree of the inflammatory reaction was remarkably less than in comparable biopsy material. The accumulation of lipofuscin pigment was of equa degree. The collapsed areas usually involved the central zones as well as the immediate periporta area of the parenchyma.

In addition, slits of collapsed parenchyma produced septums linking central zones with each other as well as with portal tracts and dissected portions of the lobules (fig. 4). The collapse appeared recent since the wavy collagenous membranes of the collapsed zones in connective tissue stain were differentiated from the heavy connective tissue bundles of the preformed portal tracts. The isolated portions of the parenchyma exhibited conspicuous regeneration, with giant cells and plates that were two or more cells thick in places where there was still degeneration and necrosis as well as bile stasis. In some of these nodules, the liver cell plates were rearranged concentrically to present the typical regenerative nodules of cirrhosis. Bile ductules often connecting with liver cells were just as

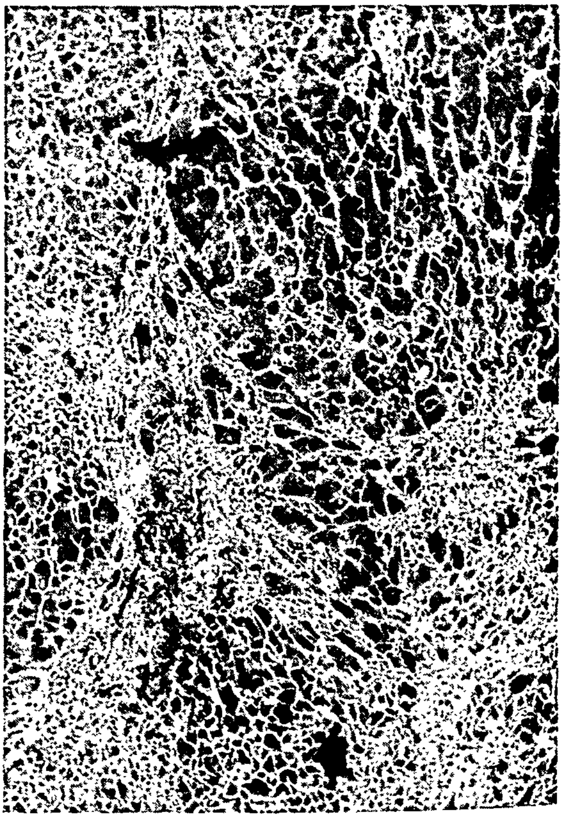


Fig. 4 (case 21).—Photomicrograph of liver autopsy specimen of patient who developed jaundice after intake of iproniazid. Subacute hepatitis existed with submassive collapse, acute degeneration (*straight arrow*), and beginning nodular regeneration and bile stasis (*curved arrow*) (hematoxylin and eosin stain) (63×).

prevalent as in the acute group. Frequently their lumens appeared dilated by large dense microcalculi, and, in two instances, bile infarcts were esent. The nodular transformation of the parenyma represented transition into early postnecrotic rrhosis, but in most instances broad areas of acute assive collapse were still present. Jaundice had en present from 17 to 53 days.

Two cases (cases 4 and 23), which were of shorter duration, presented a transition between both groups. In these specimens necrosis and collapse were observed in the centrolobular and periportal areas, while spotty necrotic changes were seen in the remainder of the parenchyma.

The results of some hepatic tests are available in 25 of the 27 patients (table 2). The total serum bilirubin level was elevated in all patients for whom findings were reported. In 11 of the fatal cases and in 5 of the nonfatal cases, the bilirubin values exceeded 15 mg. per 100 ml. of serum close to the time at which specimens for pathological examination were obtained. In one instance (case 2) the bilirubin value 10 days before death of the patient was almost three times that recorded preterminally. In five other fatal instances (cases 1, 3, 10, 13, and 25), bilirubin levels rose progressively. In five nonfatal cases (5, 7, 12, 16, and 19) records are available of the return of bilirubin levels, as well as of the abnormal findings in other hepatic tests, to normal as these patients recovered, except for prolonged elevation of sulfobromophthalein retention in case 19. At least in one instance (case 11) the bilirubin value remained above 20 mg. per 100 ml. for one month.

Table 2.—*Results of Hepatic Tests Done Close to Time of Biopsy or Death*

Case, No.	Type of Specimen*	Total Bilirubin Level, Mg. %	Cephalin Flocculation	Thymol Turbidity, Units	Serum Albumin Level, Gm. %	Serum Globulin Level, Gm. %	Serum Alkaline Phosphatase, Units†	Serum Glutamic Oxalacetic Transaminase, Units
1	A	12.4	3+	...	3.1	2.6	6.0 B.U.	...
2	A	12.0	...	12.3	...	...	4.1 B.U.	213
3	A	27.0	...	...	...	...	...	...
4	A	2.2	...	...	...	...	...	...
5	B	2.1	neg.	3.9	...	...	4.4 K.A.U.	35
6	A	33.0	...	...	1.6	2.4	4.5 B.U.	...
7	B	21.4	2+	5.4	3.4	2.8	13.7 K.A.U.	100
8	B	12.0	4+	4.5	4.3	4.0	3.6 B.U.	...
9	B	...	4+	20.5	normal	normal	...	...
10	A	35.0	...	16.0	...	...	7.1 B.U.	910
11	B	39.2	4+	47.5	2.8	4.8	8.3 B.U.	...
12	B	12.5	3+	9.5	3.9	2.7	21.2 B.U.	540
13	A	17.4‡	neg.	16.5	...	...	7.0 B.U.	280
14	A	30.0	3+	5.7	3.5	4.0	21.2 K.A.U.	460
15	A	16.7	4+	6.4	...	...	8.4 B.U.	224
16	B	31.4	2+	...	3.0	4.6	15.8 K.A.U.	740
17	B§	13.4	4+	10.3	4.2	3.0	7.2 B.U.	...
18	B	7.4	4+	2.3	...	..	6.2 S.J.U.	1,950
19A	B	15.2	...	5.3	4.2	2.1	8.9 K.A.U.	640
19B	B	0.7	...	...	4.8	2.1	4.6 K.A.U.	22
20	B	31.2	2+	12.2	...	...	...	...
21	A	24.4	4+	2.8	3.3	3.4	16.9 K.A.U.	183
22	A	58.0	4+	23.0	...	...	7.9 B.U.	2,000
23‖	A	...	...	...	...	...	...	...
24	A	80.3	...	...	...	...	...	...
25A	B	33.4	4+	14.2	...	...	5.7 B.U.	720
25B	A	31.4	3+	14.0	...	...	4.8 B.U.	...
26‖	A	...	...	...	...	...	...	...
27	A	32.3	...	15.0	...	...	9.4 B.U.	89

* A = autopsy; B = biopsy.
† B.U. = Bodansky Units; K.A.U. = King-Armstrong Units; S.J.U. = Shinowara-Jones Units.
‡ Direct reading.
§ This patient died subsequently.
‖ Data not available.

Clinical and Laboratory Findings

The clinical manifestations of the four patients observed uniformly in one institution [4f] and of the patients on whom pertinent information was obtained by questionnaires were those of diffuse parenchymal liver disease, mostly without fever. Hepatomegaly was present in a large number of cases. Sometimes the liver was tender and shrank in the preterminal period. To our knowledge, two of the patients studied by biopsy died subsequently (cases 17 and 25A). From the latter patient (case 25B) an autopsy specimen was also obtained. Hepatic coma seemed to have been present in all fatal cases.

Cephalin flocculation was 3+ or 4+ in 12 of 17 patients for whom values were reported. Thymol turbidity, which was above 4 units in 16 of 20 patients, exceeded 15 units in 5 instances. The serum activity of alkaline phosphatase was outside the normal range in 16 of the 20 patients in whom results were available. The values of transaminase which were reported for 15 patients were all elevated with the exception of that in one patient (case 5). However, in one instance, the elevated transaminase value decreased to within normal limits at the time of the second biopsy (case 19B). In three patients (cases 2, 13, and 27) transaminase values dropped precipitously before death. One patient (case 18), with a very high transaminase value, was known to have had jaundice about seven years ago. Significant aberrations of red and white blood cell counts were not reported in any of the cases.

Iproniazid Intake

The total amounts of iproniazid administered to the individual patients ranged from 600 to 19,200 mg. (table 1). In the fatal cases the average total dose, the average duration of medication, and the average daily dose per patient were 5,672 mg., 61.9 days, and 106.7 mg. respectively. In the nonfatal cases the corresponding figures were 3,484 mg., 47.4 days, and 80.5 mg. respectively. The difference in total iproniazid intake between fatal and nonfatal cases is statistically insignificant ($p < 0.3$).

In most instances, iproniazid therapy was discontinued on the onset of jaundice, but in a few patients drug administration was continued for a few days after the icterus had developed. Contrariwise, in one fatal case and in one nonfatal case, therapy was stopped 12 days and 20 days, respectively, prior to the development of jaundice. Moreover, one patient (case 4), who received an average daily dose of 102 mg. for 31 days, died, but another patient (case 8), who was given an average daily dose of 118 mg. for 102 days, survived.

Comment

The presented cases of fatal and nonfatal jaundice occurring after iproniazid therapy raise the following questions: 1. Are the hepatic lesions sufficiently uniform to indicate a single, well-defined disease process? 2. What is the basic pathology? 3. What is the relation between structural alterations of the liver and the clinical manifestations? 4. What is the relation between the iproniazid dose and the severity of the hepatic lesions. 5. What causal relationship between iproniazid administration and these lesions can be assumed?

When jaundice develops after administration of a drug or during the course of a disease, pathological study frequently uncovers a variety of lesions, some of which appear not related to the drug or the disease in question but rather have coincidental causes, e. g., biliary tract disease. In contrast, the cases described here represent a uniform pathological process which varies only in the severity and duration of the lesions. No morphologic evidence of a preexisting liver disease was found. Features predominant in the autopsy specimens were observed in the biopsy specimens and vice versa, suggesting transitional stages between fatal and nonfatal cases. Such stages are usually not as clear in other material of hepatitis.

Basically, the lesion may be described as a diffuse hepatocellular injury with associated inflammatory reaction and bile stasis. The lesion seems to proceed from single cell necrosis to diffuse necrosis with subsequent collapse of whole lobules, particularly in autopsy specimens. A submassive necrosis may leave parts of the parenchyma intact, which may undergo transformation into nodules. Then, features of cirrhosis, such as regenerative nodules and connective tissue septums linking portal tracts and central fields, become apparent, and, in a few cases, the diagnosis of active postnecrotic cirrhosis is justified. Because of the presence of relatively well-preserved parenchyma, it would appear that in these instances the fatal hepatic failure may have been caused by cholestasis reflected in bile infarcts rather than by the loss of liver cells.

The picture of the hepatitis as described above is dissimilar to that usually associated with the exposure to chemicals and which is reproducible in animals.[5] In such lesions, produced, for example, by carbon tetrachloride intoxication, one zone of the liver lobule is characteristically involved, and neighboring liver cells have a similar appearance. Such a picture is to be expected with a poison which has a metabolic effect and is uniformly distributed through the blood stream. Moreover, in toxic hepatitis, fatty metamorphosis is usually prominent, large cell breakdown products are abundant, and the inflammatory response, if present, is subdued and mainly characterized by segmented leukocytes.

In the cases under study, however, the diffuse distribution of the lesion and the conspicuous differences from cell to cell in the spotty necrotic stages would be more in keeping with an infectious process in which the causative agent grows at different rates in various cells. Such changes are typical, for instance, of the usual form of viral hepatitis. While viral hepatitis is not characterized by a single histological finding, a combination of several changes is taken as suggestive evidence for this disease.[6] Confirmation will be available when etiological tests have been developed.

The cases presented reveal all the pathological features of viral hepatitis listed in the classic description of both the nonfatal spotty necrotic form[8] and the fatal, usually massive necrotic form[7] of this disease. In this respect, the following findings in the material presented should be emphasized: the sparsity of breakdown products of hepatic cells in the necrosis; the early tendency of individual liver cells to regenerate; the mononuclear inflammatory reaction with frequent admixture of eosinophils; and the conspicuous ductular proliferation and lipofuscin deposition, as well as the presence of acidophilic bodies in 17 cases and of phlebitis of the hepatic vein branches in 16 instances.

In keeping with these morphologic observations, the clinical picture is also that of a diffuse involvement of the hepatic parenchyma. Various gradations of the process are observed, including fatal hepatic insufficiency characterized by coma. Examples of recovery as well as of chronicity have been substantiated histologically. Viral hepatitis is known to produce a great variety of clinical pictures[8] which makes it difficult to decide on clinical grounds whether viral hepatitis is present in a patient with diffuse hepatic involvement. Several features in this series are not common in the usual type of viral hepatitis. First, fever was frequently absent. Second, jaundice was, on the average, deeper than usually seen. Third, the histological alterations in the biopsy specimens of the patients with jaundice after iproniazid administration were far more severe than in a random material of viral hepatitis, but this may be an incidental result of sampling. However, the histological alterations are also more severe than would be expected from the clinical manifestations. Particularly, the collapse of contiguous parts of the parenchyma is not often observed in biopsy specimens from patients with viral hepatitis. Many clinicians are hesitant to perform liver biopsy in the presence of such changes. Finally, the high incidence of fatality, which often occurs with a fulminant course, indicates a much higher mortality than in the usual type of viral hepatitis, particularly in younger age groups. The numerical relation of autopsy to biopsy specimens in this material does not reflect the actual mortality, because autopsy specimens are more readily available than biopsy specimens. However, it is a safe assumption that the mortality is many times higher than that in viral hepatitis which, in the United States, is between 0.5 to 1%.[9]

The laboratory findings also support the concept of a diffuse disorder of the hepatic parenchyma in contrast to the hepatitis of the cholestatic type, such as may follow the administration of chlorpromazine.[1] However, in contrast to the situation in usual cases of viral hepatitis, cephalin flocculation is not quite as often abnormal and the thymol turbidity is less frequently very high. This has been considered characteristic of the serum type of hepatitis.[8] The frequent absence of febrile manifestations as well as the greater severity of the disease process, including a higher mortality and a more rapid course, have been observed[10] in some types of serum hepatitis, particularly when it occurs in elderly women.

The information on the dosage of iproniazid used in the cases presented was obtained mainly by means of a questionnaire. Taking these data at their face value, it is evident that the average total drug intake and the average daily dose were greater and that the average duration of drug therapy was longer in the fatal than in the nonfatal cases. However, the lack of statistical significance of these differences speaks against a definite relationship between the size of the daily dose and the duration of treatment with iproniazid on the one hand and the severity and outcome of the hepatitis on the other. A similar situation seems to exist with cinchophen, the administration of which is also associated with a very low incidence of hepatic necrosis of high mortality, without evidence of a relationship between dose and extent of lesion.[11]

In an attempt to clarify the possible etiological relation between iproniazid administration and the hepatic lesions observed, several possibilities must be considered. First, the hepatic disease may be not caused by iproniazid but is rather coincidental and may, for instance, be a viral infection transmitted by a poorly sterilized needle used in the course of other therapeutic procedures. This has been thought to be a possibility in the jaundice that occurs after administration of cinchophen.[11] However, it seems that the incidence of liver damage is much higher in these patients than in patients who were treated with other drugs and may have received parenteral therapy.

A second possibility is that iproniazid may produce a toxic effect which is indistinguishable from viral hepatitis. Acute yellow atrophy, resembling viral hepatitis, has been reported in a very low incidence after the administration of other drugs, e. g., sulfonamides[12] or zoxazolamine.[13] Thus, some drugs may produce occasionally the same metabolic changes as a virus, or both might elicit the same hyperergic reaction.

Before the inability to differentiate pathologically viral and toxic hepatitis is conceded, a third possibility should at least be considered, namely, that iproniazid activates subclinical viral hepatitis, particularly of the serum type (type SH or B). It is conceivable that this drug would produce an active disease process in a carrier. In view of the relatively low incidence of hepatitis in patients treated with iproniazid, it is apparent that not every carrier would develop jaundice if exposed to iproniazid. Further studies on the hepatitis associated with iproniazid therapy may throw new light on the mechanism of infection in viral hepatitis.

Because of the clinical and pathological similarity between the jaundice that occurs after administration of iproniazid and that which results from viral

doctors try to limit themselves to those surgical procedures that are more consistent with their training and experience.

The following suggestions brought out by the tissue committee have been adopted by our hospitals: (1) a uniform code for the sterilization of patients in one of our hospitals, (2) the routine performance of proctoscopic or sigmoidoscopic examination prior to hemorrhoid operations, (3) the routine pathological examination of all tissues removed at operation except tonsils, and (4) the routine performance of total hysterectomy rather than subtotal hysterectomy except in rare instances. The improvements brought out by the activity of the tissue committee have stimulated the staff at one hospital to appoint a medical audit committee and to hold a monthly death conference.

TABLE 1.—*Percentage of Pathological Findings in Appendectomies in One Hospital*

No. Removed	% Pathological	No. Removed	% Pathological
89	54	19	24
51	49	18	66
46	85	18	55
37	87	15	73
28	54	13	70
28	70	9	77
27	66	8	63
23	69	5	80
22	86	5	20
20	85		

Defects of Committee

On the other hand, it is recognized that abuses can occur in the functioning of a tissue committee. Medicolegal hazards may possibly develop, and malpractice suits could be generated by the actions of the committee. It is our feeling that the record of its activities should not be preserved except in tabular form, thereby preventing the identification of the action of the tissue committee in any given case, and that use of specific names of staff members be avoided. This practice of not keeping identifiable records may not fully meet the requirements of the Joint Commission, but we hope they will recognize this legal implication and act accordingly. Physicians should be advised to be discreet and not to discuss the specific activities of the tissue committee among themselves in the presence of curious hospital personnel, since this might lead to misunderstanding and malicious gossip. close to each other and do not like to criticize the work of others. In such instances, it is suggested that doctors from other hospitals be asked to serve on the tissue committee.

Some small hospitals do not have pathologists on their staffs. A pathologist is not indispensable, although his findings usually are a definite aid. Most physicians accept the findings of the tissue committee with dignity. Many have been heard to say that they learn more from these reports and discussions than from any other one meeting that they attend.

Statistical Data

The following statistical data demonstrate some of the problems and results encountered in our program. From 1953 to 1957, a total of 219 gallbladders were removed in one of our hospitals. Of these, 185 (85%) were pathological. Improvement is needed here, but without the work of the tissue committee we would not have known it. In another hospital 95 gallbladders were removed in the same period. Of these, 92% were found to be pathological.

The appendectomies done in a hospital always seem to reflect in some manner the surgery being done. In 1956 in one hospital 107 appendectomies were performed; 70 (66%) were pathological. In another hospital 111 appendectomies were done; 72 (65%) were pathological. In a third hospital 153 appendectomies were performed; 126 (82%) were pathological. Table 1 gives records kept in one hospital for physicians who did five or more appendectomies from 1954 to 1957. The appendix was judged pathological if any type disease was found by the pathologist.

In the field of pelvic surgery, in one hospital 41 suspensions were performed in 1951, 25 in 1952, 30 in 1953, 14 in 1954, and 10 in 1955. At another hospital 36 suspensions were performed in 1950 and only 4 in 1956. The following table shows the decline in subtotal hysterectomies performed.

Since the records in our hospitals prior to the formation of the tissue committees are not adequate, many true relationships cannot be shown.

Give the tissue committee executive power. 2. The tissue committee should be composed of doctors who have proper training and/or experience, and who are willing to actively work on the committee in an absolutely unbiased manner. 3. Full surgical privileges should not be granted to inadequately trained and inadequately experienced physicians; every staff member should be granted privileges according to his demonstrated competence regardless of the certificates he may hold. 4. Similar committees should be formed in other departments, such as medicine and obstetrics. 5. Local control of the practice of medicine and surgery is far better than control from Washington, Chicago, or elsewhere. 6. If no pathologist is available, the tissue committee should function just as effectively. 7. If the staff is too small to have an effective committee, neighboring doctors should be asked to serve on such a committee. It is obvious that the work of the tissue committee in hospitals has improved the quality of patient care.

427 W. Oak St. (Dr. Henley).

EFFECT OF AIR FLOW RESISTANCE ON VENTILATION AND RESPIRATORY MUSCLE ACTIVITY

B. Raymond Fink, M.D., Shih-Hsun Ngai, M.D.
and
Duncan A. Holaday, M.D., New York

As measured in decerebrate cats, inspiratory air flow resistance initially reduces the tidal volume and frequency of respiration. The reduction in tidal volume is aggravated by pentobarbital, nitrous oxide, or ether. If the flow resistance persists, there is a gradual recovery in the volume of ventilation, but even in the unanesthetized state this is not complete at the end of five minutes. Ventilation is reduced with increased airway resistance in spite of augmented muscular activity. The reduction of ventilation is proportional to the magnitude of the resistance.

Although there is general agreement that increased resistance to air flow has an adverse effect on ventilation, there have been very few quantitative studies of this subject. Recently it was reported[1] that in man an added airway resistance maintained for five minutes caused a reduction in pulmonary ventilation and a rise in alveolar carbon dioxide tension. The object of the present study was to measure the effect of air flow resistance on ventilation and diaphragmatic muscular activity. The influence of anesthetic agents on the response to increased airway resistance was also investigated.

Method

Studies were made on decerebrate cats in order to obtain continuous observation of the unanesthetized and anesthetized states. Decerebration was performed at midcollicular level during diethyl ether anesthesia. Measurements were made one hour or more after the completion of decerebration, at which time the preparation was stable and most of the ether eliminated. Control observations were made while the animals breathed room air. Nitrous oxide–oxygen or diethyl ether oxygen mixture was introduced through a non-rebreathing valve. Pentobarbital sodium in divided doses was administered intravenously.

Recordings were made with the use of five channels of an eight-channel cathode-ray oscillograph. The tidal volume was measured with a small animal pneumotachograph and displayed on one channel of the recorder, the output of which was integrated electronically, with use of a second channel. The airway pressure was obtained with a strain-gauge transducer. The action potentials of the diaphragm from two monopolar electrodes inserted through the ninth intercostal space were amplified and recorded on the fourth channel. In addition, the electromyogram was integrated on the fifth channel, thus providing an estimate of total electrical activity as well as the frequency of dis-

---

From the Department of Anesthesiology, Columbia University College of Physicians and Surgeons, and the Anesthesiology Service, Presbyterian Hospital.

Read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

doctors try to limit themselves to those surgical procedures that are more consistent with their training and experience.

The following suggestions brought out by the tissue committee have been adopted by our hospitals: (1) a uniform code for the sterilization of patients in one of our hospitals, (2) the routine performance of proctoscopic or sigmoidoscopic examination prior to hemorrhoid operations, (3) the routine pathological examination of all tissues removed at operation except tonsils, and (4) the routine performance of total hysterectomy rather than subtotal hysterectomy except in rare instances. The improvements brought out by the activity of the tissue committee have stimulated the staff at one hospital to appoint a medical audit committee and to hold a monthly death conference.

TABLE 1.—*Percentage of Pathological Findings in Appendectomies in One Hospital*

No. Removed	% Pathological	No. Removed	% Pathological
89	54	19	24
51	49	18	66
46	85	18	55
37	87	15	73
28	54	13	70
28	70	9	77
27	66	8	63
23	69	5	80
22	86	5	20
20	85		

Defects of Committee

On the other hand, it is recognized that abuses can occur in the functioning of a tissue committee. Medicolegal hazards may possibly develop, and malpractice suits could be generated by the actions of the committee. It is our feeling that the record of its activities should not be preserved except in tabular form, thereby preventing the identification of the action of the tissue committee in any given case, and that use of specific names of staff members be avoided. This practice of not keeping identifiable records may not fully meet the requirements of the Joint Commission, but we hope they will recognize this legal implication and act accordingly. Physicians should be advised to be discreet and not to discuss the specific activities of the tissue committee among themselves in the presence of curious hospital personnel, since this might lead to misunderstanding and malicious gossip.

close to each other and do not like to criticize the work of others. In such instances, it is suggested that doctors from other hospitals be asked to serve on the tissue committee.

Some small hospitals do not have pathologists on their staffs. A pathologist is not indispensable, although his findings usually are a definite aid. Most physicians accept the findings of the tissue committee with dignity. Many have been heard to say that they learn more from these reports and discussions than from any other one meeting that they attend.

Statistical Data

The following statistical data demonstrate some of the problems and results encountered in our program. From 1953 to 1957, a total of 219 gallbladders were removed in one of our hospitals. Of these, 185 (85%) were pathological. Improvement is needed here, but without the work of the tissue committee we would not have known it. In another hospital 95 gallbladders were removed in the same period. Of these, 92% were found to be pathological.

The appendectomies done in a hospital always seem to reflect in some manner the surgery being done. In 1956 in one hospital 107 appendectomies were performed; 70 (66%) were pathological. In another hospital 111 appendectomies were done; 72 (65%) were pathological. In a third hospital 153 appendectomies were performed; 126 (82%) were pathological. Table 1 gives records kept in one hospital for physicians who did five or more appendectomies from 1954 to 1957. The appendix was judged pathological if any type disease was found by the pathologist.

In the field of pelvic surgery, in one hospital 41 suspensions were performed in 1951, 25 in 1952, 30 in 1953, 14 in 1954, and 10 in 1955. At another hospital 36 suspensions were performed in 1950 and only 4 in 1956. The following table shows the decline in subtotal hysterectomies performed.

Since the records in our hospitals prior to the formation of the tissue committees are not adequate, many true relationships cannot be shown. Also, one of the hospitals is new and no prior records are available. Even so, improvement from a surgical standpoint can be seen.

TABLE 2.—*Hysterectomies Performed in Three Hospitals*

	Hospitals					
	1		2		3	
	1951	1955	1951	1955	1950	1956
Total	142	132	53	61	111	250
Subtotal	73	11	25	16	71	12

USES AND ABUSES OF THE TISSUE COMMITTEE

Paul G. Henley, M.D., Kenneth R. Duzan, M.D., El Dorado, Ark.
and
Rufus B. Robins, M.D., Camden, Ark.

A tissue committee is a group of physicians chosen within a hospital to review the histories of patients from whom tissues have been removed surgically; its purpose is to give an opinion on the correctness of the diagnosis and treatment. Data show that in the past there has been a marked diversity of practice among surgeons, with a lack of demonstrable abnormality in more than half of the appendixes removed by some surgeons. Since the formation of tissue committees, many improvements have been noted in the thoroughness of physical examinations, frequency of consultation, quality of operation, and preoperative and postoperative care. There has been a decrease in the frequency of subtotal hysterectomies, suspensoons of the uterus, ill-advised appendectomies, and other dubious, needless, or exploratory operations. The tissue committee is a device that has defects and dangers; but when made up of qualified, conscientious, and tactful physicians and properly organized with respect to the hospital, it has contributed greatly to the improvement of patient care.

Today most of the hospitals of the United States have some type of a committee, generally known as the tissue committee, set up for the control and evaluation of the surgery being done in a hospital. It is a requirement of the Joint Commission on the Accreditation of Hospitals. The problems in large teaching hospitals and in the smaller open staff hospitals are somewhat different. In this discussion we are referring mainly to the latter. We are working in two hospitals of this type: one has 150 beds and the other 125 beds. It is our purpose to try to point out some of the problems that confront such a committee in these hospitals because the committees are new and because they can do pioneer work if certain limitations are noted.

In the history of medicine, the control of itself for the benefit of others—the public—has always been paramount. In American medicine, the American Medical Association, the Association of Medical Colleges, and the American College of Surgeons, as well as other bodies, have been the forces behind our self-control programs. Today two other organizations, the Joint Commission on the Accreditation of Hospitals and the American Academy of General Practice have joined in this endeavor, not only in surgery but in all aspects of the practice of medicine. It is to be noted also that all of this work, all of this effort, has been exerted in order to control a small minority of doctors. A few individuals although properly trained and experienced are inclined to be unscrupulous. They require supervision and control on the part of conscientious colleagues.

In our particular hospitals the tissue committee is composed of the pathologist, the only continuing member, and three other members of the staff, who serve for a period of one year and are appointed by the chief of staff. Our open staff hospitals admit members of the county medical society to practice in the hospitals and therefore we have all types of physicians with all types of training and experience.

Our tissue committee functions in an advisory capacity only and has no executive powers. Decisions are based on the facts presented by the entire case in question. Neither a pathological ratio nor a strict auditing method is used as the sole criterion for decisions. It does not investigate all cases; for example, the orthopedic cases have not been investigated. It checks the cases where tissue has been submitted for examination. The research may show that, in the opinion of the tissue committee, certain diagnoses are not justified and why. It also brings up cases for open discussion at an executive meeting of the staff. Its findings are kept confidential, in that only members of the committee and the staff members are present at the discussions. Any doctor who has a case up for discussion is notified 24 hours in advance. The committee reports once a month to the staff meeting.

Since the formation of the tissue committees in our hospitals there have been many improvements noted in surgery, such as better records, better preoperative and postoperative care, more consultations, less doubtful and needless surgery, better examination of patients, and a fewer number of so-called exploratory operations. It is difficult for any doctor to exploit, during surgical exploration, the female pelvis, the gall-bladder, or the appendix or to do any questionable surgery without its being known by the tissue committee, who would call his attention to it. It is also noted that most of the

---

Read before the Section on General Practice at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

hepatitis, it is readily understood why a causal relation between drug therapy and hepatic injury was not suspected until a considerable number of cases had occurred.

Whatever the mechanism, the fact that jaundice and diffuse hepatic injury, usually of great severity, occur in a small number of patients treated with iproniazid must be taken into account when prescribing this drug and invites, just as with other potent drugs, careful evaluation of the limitations, indications, and contraindications of iproniazid. Periodic checking by sensitive hepatic tests might reduce the risk.

Summary

A histological study was made of 13 biopsy specimens and 16 autopsy specimens of livers which were obtained in a nationwide collection from 27 patients who had developed jaundice after the administration of iproniazid (Marsilid) phosphate. The findings were correlated with the clinical manifestations of the hepatic disease and the dose of drug administered. The pathological picture was that of a diffuse hepatic parenchymal disease which ranged from a spotty necrosis of single cells to a diffuse massive necrosis and collapse, both associated with inflammatory infiltration. Tendency to transition into postnecrotic cirrhosis was apparent. The morphologic alterations were those considered characteristic of viral hepatitis. Histological evidence of preexisting liver disease was absent. Also, the clinical manifestations were those of a diffuse parenchymal involvement of the liver, but, in contrast to the usual cases of viral hepatitis, fever was frequently absent, the anatomic lesions were more severe than would be expected from the clinical picture, the jaundice was deeper, the process as a whole was more virulent, the mortality was higher, and the serum protein reactions were not as often altered.

A relationship between the dosage of iproniazid and the extent of the lesion was not evident, and jaundice appeared as late as 20 days after the cessation of therapy. The role which iproniazid may play in producing hepatic lesions is not clear; this is also true of other drugs such as cinchophen. The possibilities have to be considered that drugs such as iproniazid and others may produce morphologic changes previously considered characteristic of viral hepatitis in a low incidence or that these drugs may activate an existing subclinical vital hepatitis, e. g., in a carrier of serum hepatitis. Whatever the causal relation, the possible occurrence of severe hepatic damage with a deceptively less severe clinical picture but with a high mortality should be kept in mind when iproniazid is administered and should be weighed against its definite usefulness in patients with disabling depressions.

Mt. Sinai Hospital, Fifth Avenue and 100th Street (29).

This study was supported by the Jacqueline Armour Memorial Fund for the Study of Hepatic Disease, the Mount Sinai Hospital, New York.

Drs. Leo A. Pirk and Robert Dixon of the department of clinical investigation of Hoffmann-LaRoche, Inc., Nutley, N. J., made available for this study all pathological material collected by them as well as the pertinent information at their disposal. Clinicians and pathologists from many parts of the United States contributed findings and specimens.

References

1. Popper, H., and Schaffner, F.: Pathology of Intrahepatic Cholestatic Jaundice, J. A. M. A., to be published.

2. Selikoff, I. J., and Robitzek, E. H.: Tuberculosis Chemotherapy with Hydrazine Derivatives of Isonicotinic Acid, Dis. Chest **21:**385-438 (April) 1952.

3. Kline, N. S.: Clinical Experience with Iproniazid (Marsilid), J. Clin. & Exper. Psychopath. (supp. 1) **19:**72-79 (June) 1958. Crane, G. E.: Further Studies on Iproniazid Phosphate, J. Nerv. & Ment. Dis. **124:**322-331 (Sept.) 1956.

4. (*a*) Scherbel, A. L.: Effect of Isoniazid and of Iproniazid in Patients with Rheumatoid Arthritis, Cleveland Clin. Quart. **24:**90-97 (April) 1957. (*b*) DeVerteuil, R. L., and Lehmann, H. E.: Therapeutic Trial of Iproniazid (Marsilid) in Depressed and Apathetic Patients, Canad. M. A. J. **78:**131-133 (Jan. 15) 1958. (*c*) Zetzel, L., and Kaplan, H.: Liver Damage Concurrent with Iproniazid Administration, New England J. Med. **258:**1209-1211 (June 12) 1958. (*d*) Smarr, E. R.; Wolf, H.; and Pressman, M. D.: Experience with Marsilid with Report of One Death, Am. J. Psychiat. **114:**1115-1116 (June) 1958. (*e*) Frantz, A. G.: Fatal Jaundice Associated with Iproniazid (Marsilid) Therapy, Report of Case, J. A. M. A. **167:**987-988 (June 21) 1958. (*f*) Kahn, M., and Perez, V.: Iproniazid (Marsilid) Hepatitis: Report of Nine Cases, Am. J. Med. **25:**898-916 (Dec.) 1958.

5. Popper, H., and Franklin, M.: Viral Versus Toxic Hepatic Necrosis, Arch. Path. **46:**338-376 (Oct.) 1948.

6. Smetana, H. F.: Histologic Diagnosis of Viral Hepatitis by Needle Biopsy, Gastroenterology **26:**612-625 (April) 1954.

7. Lucké, B., and Mallory, T. B.: Fulminant Form of Epidemic Hepatitis, Am. J. Path. **22:**867-945 (Sept.) 1946.

8. Havens, W. P., Jr.: Infectious Hepatitis, Medicine **27:**279-326 (Sept.) 1948.

9. Neefe, J. R.: Viral Hepatitis, in Diseases of Liver, edited by L. Schiff, Philadelphia, J. B. Lippincott Company, 1956, p. 302.

10. References 7 and 9.

11. Bollman, J. L.: Cinchophen Hepatitis, editorial, Gastroenterology **24:**270 (June) 1953.

12. Klatskin, G.: Toxic Hepatitis, in Diseases of Liver, edited by L. Schiff, Philadelphia, J. B. Lippincott Company, 1956, p. 328.

13. Hoffbauer, F. W.; Nelson, O. L. N.; Wagner, D. J.; and Knutsen, A.: Fatal Liver Necrosis in Two Patients Receiving Zoxazolamine, abstracted, Gastroenterology **34:**1048 (June) 1958.

USES AND ABUSES OF THE TISSUE COMMITTEE

Paul G. Henley, M.D., Kenneth R. Duzan, M.D., El Dorado, Ark.
and
Rufus B. Robins, M.D., Camden, Ark.

A tissue committee is a group of physicians chosen within a hospital to review the histories of patients from whom tissues have been removed surgically; its purpose is to give an opinion on the correctness of the diagnosis and treatment. Data show that in the past there has been a marked diversity of practice among surgeons, with a lack of demonstrable abnormality in more than half of the appendixes removed by some surgeons. Since the formation of tissue committees, many improvements have been noted in the thoroughness of physical examinations, frequency of consultation, quality of operation, and preoperative and postoperative care. There has been a decrease in the frequency of subtotal hysterectomies, suspensoons of the uterus, ill-advised appendectomies, and other dubious, needless, or exploratory operations. The tissue committee is a device that has defects and dangers; but when made up of qualified, conscientious, and tactful physicians and properly organized with respect to the hospital, it has contributed greatly to the improvement of patient care.

Today most of the hospitals of the United States have some type of a committee, generally known as the tissue committee, set up for the control and evaluation of the surgery being done in a hospital. It is a requirement of the Joint Commission on the Accreditation of Hospitals. The problems in large teaching hospitals and in the smaller open staff hospitals are somewhat different. In this discussion we are referring mainly to the latter. We are working in two hospitals of this type: one has 150 beds and the other 125 beds. It is our purpose to try to point out some of the problems that confront such a committee in these hospitals because the committees are new and because they can do pioneer work if certain limitations are noted.

In the history of medicine, the control of itself for the benefit of others—the public—has always been paramount. In American medicine, the American Medical Association, the Association of Medical Colleges, and the American College of Surgeons, as well as other bodies, have been the forces behind our self-control programs. Today two other organizations, the Joint Commission on the Accreditation of Hospitals and the American Academy of General Practice have joined in this endeavor, not only in surgery but in all aspects of the practice of medicine. It is to be noted also that all of this work, all of this effort, has been exerted in order to control a small minority of doctors. A few individuals although properly trained and experienced are inclined to be unscrupulous. They require supervision and control on the part of conscientious colleagues.

In our particular hospitals the tissue committee is composed of the pathologist, the only continuing member, and three other members of the staff, who serve for a period of one year and are appointed by the chief of staff. Our open staff hospitals admit members of the county medical society to practice in the hospitals and therefore we have all types of physicians with all types of training and experience.

Our tissue committee functions in an advisory capacity only and has no executive powers. Decisions are based on the facts presented by the entire case in question. Neither a pathological ratio nor a strict auditing method is used as the sole criterion for decisions. It does not investigate all cases; for example, the orthopedic cases have not been investigated. It checks the cases where tissue has been submitted for examination. The research may show that, in the opinion of the tissue committee, certain diagnoses are not justified and why. It also brings up cases for open discussion at an executive meeting of the staff. Its findings are kept confidential, in that only members of the committee and the staff members are present at the discussions. Any doctor who has a case up for discussion is notified 24 hours in advance. The committee reports once a month to the staff meeting.

Since the formation of the tissue committees in our hospitals there have been many improvements noted in surgery, such as better records, better preoperative and postoperative care, more consultations, less doubtful and needless surgery, better examination of patients, and a fewer number of so-called exploratory operations. It is difficult for any doctor to exploit, during surgical exploration, the female pelvis, the gall-bladder, or the appendix or to do any questionable surgery without its being known by the tissue committee, who would call his attention to it. It is also noted that most of the

---

Read before the Section on General Practice at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

doctors try to limit themselves to those surgical procedures that are more consistent with their training and experience.

The following suggestions brought out by the tissue committee have been adopted by our hospitals: (1) a uniform code for the sterilization of *patients in one of our hospitals, (2) the routine* performance of proctoscopic or sigmoidoscopic examination prior to hemorrhoid operations, (3) the routine pathological examination of all tissues removed at operation except tonsils, and (4) the routine performance of total hysterectomy rather than subtotal hysterectomy except in rare instances. The improvements brought out by the activity of the tissue committee have stimulated the staff at one hospital to appoint a medical audit committee and to hold a monthly death conference.

TABLE 1.—*Percentage of Pathological Findings in Appendectomies in One Hospital*

No. Removed	% Pathological	No. Removed	% Pathological
89	54	19	24
51	49	18	66
46	85	18	55
37	87	15	73
28	54	13	70
28	70	9	77
27	66	8	63
23	69	5	80
22	86	5	20
20	85		

Defects of Committee

On the other hand, it is recognized that abuses can occur in the functioning of a tissue committee. Medicolegal hazards may possibly develop, and malpractice suits could be generated by the actions of the committee. It is our feeling that the record of its activities should not be preserved except in tabular form, thereby preventing the identification of the action of the tissue committee in any given case, and that use of specific names of staff members be avoided. This practice of not keeping identifiable records may not fully meet the requirements of the Joint Commission, but we hope they will recognize this legal implication and act accordingly. Physicians should be advised to be discreet and not to discuss the specific activities of the tissue committee among themselves in the presence of curious hospital personnel, since this might lead to misunderstanding and malicious gossip.

Another point to recognize is that the activities of the tissue committee may make a too conscientious doctor fail to use his better judgment at times. It may lead to undue procrastination, as in cases of surgical abdomens. Some doctors will not accept criticism and insist on their individual rights to practice medicine as they see fit. Some defy the tissue committee and others try too hard to please. Some abuse it by defending other doctors when they definitely need criticism. In small hospitals with few doctors on the staff, the doctors are very close to each other and do not like to criticize the work of others. In such instances, it is suggested that doctors from other hospitals be asked to serve on the tissue committee.

Some small hospitals do not have pathologists on their staffs. A pathologist is not indispensable, although his findings usually are a definite aid. Most physicians accept the findings of the tissue committee with dignity. Many have been heard to say that they learn more from these reports and discussions than from any other one meeting that they attend.

Statistical Data

The following statistical data demonstrate some of the problems and results encountered in our program. From 1953 to 1957, a total of 219 gallbladders were removed in one of our hospitals. Of these, 185 (85%) were pathological. Improvement is needed here, but without the work of the tissue committee we would not have known it. In another hospital 95 gallbladders were removed in the same period. Of these, 92% were found to be pathological.

The appendectomies done in a hospital always seem to reflect in some manner the surgery being done. In 1956 in one hospital 107 appendectomies were performed; 70 (66%) were pathological. In another hospital 111 appendectomies were done; 72 (65%) were pathological. In a third hospital 153 appendectomies were performed; 126 (82%) were pathological. Table 1 gives records kept in one hospital for physicians who did five or more appendectomies from 1954 to 1957. The appendix was judged pathological if any type disease was found by the pathologist.

In the field of pelvic surgery, in one hospital 41 suspensions were performed in 1951, 25 in 1952, 30 in 1953, 14 in 1954, and 10 in 1955. At another hospital 36 suspensions were performed in 1950 and only 4 in 1956. The following table shows the decline in subtotal hysterectomies performed.

Since the records in our hospitals prior to the formation of the tissue committees are not adequate, many true relationships cannot be shown. Also, one of the hospitals is new and no prior records are available. Even so, improvement from a surgical standpoint can be seen.

TABLE 2.—*Hysterectomies Performed in Three Hospitals*

	Hospitals					
	1		2		3	
	1951	1955	1951	1955	1950	1956
Total	142	132	53	61	111	250
Subtotal	73	11	25	16	71	12

Comment

It is our firm belief that the following recommendations, if adopted, would further aid in developing and maintaining high standards of surgery being done in our smaller open staff hospitals: 1.

Give the tissue committee executive power. 2. The tissue committee should be composed of doctors who have proper training and/or experience, and who are willing to actively work on the committee in an absolutely unbiased manner. 3. Full surgical privileges should not be granted to inadequately trained and inadequately experienced physicians; every staff member should be granted privileges according to his demonstrated competence regardless of the certificates he may hold. 4. Similar committees should be formed in other departments, such as medicine and obstetrics. 5. Local control of the practice of medicine and surgery is far better than control from Washington, Chicago, or elsewhere. 6. If no pathologist is available, the tissue committee should function just as effectively. 7. If the staff is too small to have an effective committee, neighboring doctors should be asked to serve on such a committee. It is obvious that the work of the tissue committee in hospitals has improved the quality of patient care.

427 W. Oak St. (Dr. Henley).

EFFECT OF AIR FLOW RESISTANCE ON VENTILATION AND RESPIRATORY MUSCLE ACTIVITY

B. Raymond Fink, M.D., Shih-Hsun Ngai, M.D.
and
Duncan A. Holaday, M.D., New York

As measured in decerebrate cats, inspiratory air flow resistance initially reduces the tidal volume and frequency of respiration. The reduction in tidal volume is aggravated by pentobarbital, nitrous oxide, or ether. If the flow resistance persists, there is a gradual recovery in the volume of ventilation, but even in the unanesthetized state this is not complete at the end of five minutes. Ventilation is reduced with increased airway resistance in spite of augmented muscular activity. The reduction of ventilation is proportional to the magnitude of the resistance.

Although there is general agreement that increased resistance to air flow has an adverse effect on ventilation, there have been very few quantitative studies of this subject. Recently it was reported[1] that in man an added airway resistance maintained for five minutes caused a reduction in pulmonary ventilation and a rise in alveolar carbon dioxide tension. The object of the present study was to measure the effect of air flow resistance on ventilation and diaphragmatic muscular activity. The influence of anesthetic agents on the response to increased airway resistance was also investigated.

Method

Studies were made on decerebrate cats in order to obtain continuous observation of the unanesthetized and anesthetized states. Decerebration was performed at midcollicular level during diethyl ether anesthesia. Measurements were made one hour or more after the completion of decerebration, at which time the preparation was stable and most of the ether eliminated. Control observations were made while the animals breathed room air. Nitrous oxide–oxygen or diethyl ether oxygen mixture was introduced through a non-rebreathing valve. Pentobarbital sodium in divided doses was administered intravenously.

Recordings were made with the use of five channels of an eight-channel cathode-ray oscillograph. The tidal volume was measured with a small animal pneumotachograph and displayed on one channel of the recorder, the output of which was integrated electronically, with use of a second channel. The airway pressure was obtained with a strain-gauge transducer. The action potentials of the diaphragm from two monopolar electrodes inserted through the ninth intercostal space were amplified and recorded on the fourth channel. In addition, the electromyogram was integrated on the fifth channel, thus providing an estimate of total electrical activity as well as the frequency of dis-

---

From the Department of Anesthesiology, Columbia University College of Physicians and Surgeons, and the Anesthesiology Service, Presbyterian Hospital.

Read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

charge. It is known that under specific conditions the integral of the electromyogram is proportional to the tension developed by the muscle.[2] In the case of the diaphragm the present study suggests that the slope of the integral during inspiration indicates the intensity of the muscular activity required for the observed flow of air.

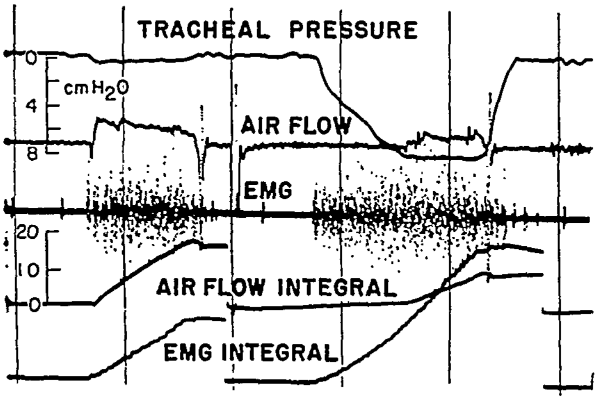


Fig. 1 (cat 27).—Actual record of normal respiration followed by one inspiration against added load of —8 cm. H_2O in unanesthetized cat. Tidal volume is measured by vertical displacement of air flow integral. Electromyogram *(EMG)* shows prolongation of diaphragmatic contraction with application of resistance, and intensity, shown by slope of electromyogram integral, increases until air flow begins, thereafter remaining steady (time lines=one second).

Inspiratory resistance to air flow was introduced by means of a vacuum-cleaner fan connected to the non-rebreathing valve through a three-way tap. The third limb of the tap led to room air or to the anesthetic reservoir. The speed of the fan was regulated by a variable transformer; the magnitude of the negative pressure generated was monitored with a water manometer. The negative pressure, when applied for single breaths by turning the three-way tap, constituted an accurately controlled inspiratory resistance. For the study of continuous inspiratory resistance during inhalation anesthesia, the resistance consisted of an appropriately weighted inspiratory valve. This allowed continued inhalation of the anesthetic mixture so that the depth of anesthesia would not be changed appreciably during the test period.

Eighteen animals were studied and were divided into four groups. In groups 1, 2, and 3, graduated resistances in steps of 2 cm. H_2O were applied for single breaths at one-minute intervals, before and after administration of anesthetics, as follows: group 1 (five cats), pentobarbital sodium given intravenously in successive doses of 6 mg. per kilogram of body weight; group 2 (four cats), 80% concentration of nitrous oxide and 20% concentration of oxygen; and group 3 (four cats), three increasing concentrations of diethyl ether vapor in oxygen. Inhalation of these anesthetic mixtures was maintained for 30 minutes before any measurement was taken so that a relatively steady state was obtained. The ether mixtures were obtained by appropriate dilution of the outflow from a "copper kettle" at the observed temperature. The ether concentration was estimated indirectly with a Pauling oxygen analyzer. In group 4 (five cats), continuous resistance to inspiration was applied for five minutes before and during anesthesia with pentobarbital or ether. Respiratory frequency, tidal volume, and diaphragmatic muscular activity were measured continuously.

Results

Unanesthetized State.—A typical example of the immediate response to increased inspiratory resistance is reproduced in figure 1. This is a record of two successive respirations: first, the control and, second, inspiration against an added resistance of −8 cm. H_2O. In the control breath, the duration of air flow corresponded almost exactly with the period of electrical discharge of the diaphragm and both integrals rose at a steady rate, indicating that the rate of air flow and the intensity of diaphragmatic contraction remained constant throughout most of the inspiratory phase. In the second breath, the air flow volume was diminished and the air flow rate was reduced, as indicated by the height and slope of the integral. The onset of inspiratory air flow was much delayed in respect to the muscular activity. The diaphragmatic contraction was prolonged and increased in intensity, as evidenced by the steeper slope of the electromyographic integral. When the response to a series of increasing air flow resistances was examined, the reduction in tidal volume was proportional to the added resistance, notwithstanding a concomitant proportionate increase in diaphragmatic activity (fig. 2). The fact that the increased diaphragmatic activity occurred immediately on application of the resist-

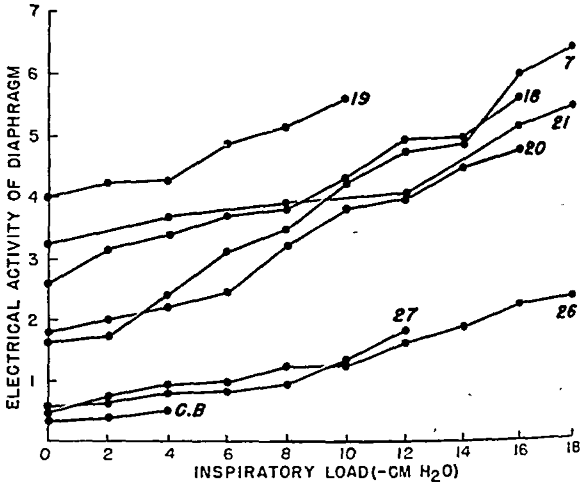


Fig. 2.—Effect of inspiratory resistance on diaphragmatic activity. Voltage output of muscle increases approximately linearly with load; increased activity was not sufficient to maintain normal tidal volume.

ance suggests that this is a reflex phenomenon, probably through the Hering-Breuer stretch reflex, since it was abolished by bilateral vagotomy.

When the resistance was maintained continuously for five minutes, the diaphragmatic activity increased in successive breaths over the first half-minute. The tidal volume decreased initially on application of resistance and recovered gradually during the five-minute period but never to the original level.

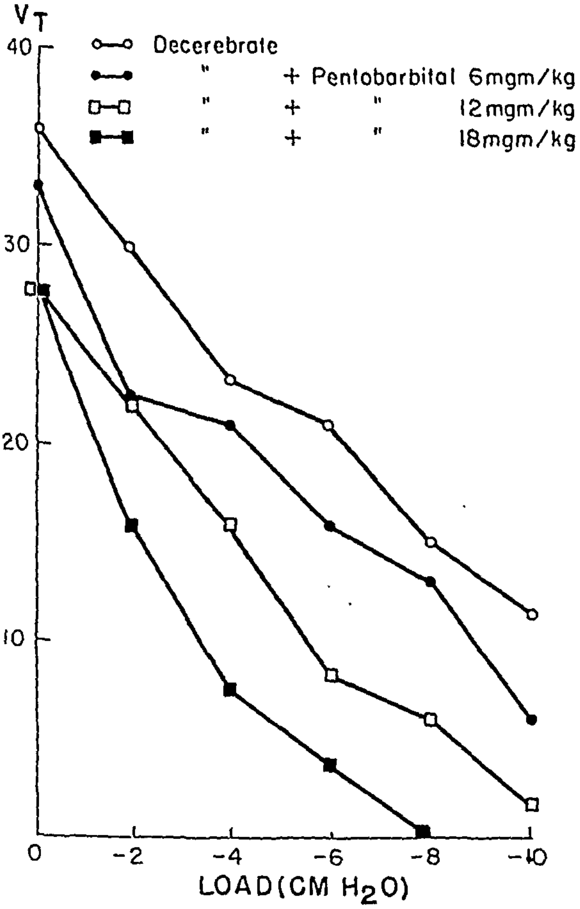


Fig. 3.—Effect of pentobarbital sodium on ventilation during inspiratory flow resistance. Ability to overcome flow resistance decreased as more drug was administered.

Anesthetized State.—The effect of pentobarbital sodium on the immediate response to inspiratory resistance was as follows: The volume and rate of air flow against the added resistance were reduced to a greater extent as compared with those in the unanesthetized animal. The diaphragmatic contraction was prolonged but showed little increase in intensity.

Application of a series of increasing inspiratory resistances caused a reduction in tidal volume proportional to the magnitude of the resistance (fig. 3), the decline occurring more rapidly with each additional dose of pentobarbital. Thus, the fractional decrease in tidal volume produced by a given resistance was relatively greater as the anesthesia was deeper. In this respect, the effects of nitrous oxide and diethyl ether were without exception similar to those of pentobarbital, as shown in figure 4. Evidently, general anesthesia exaggerates the impairment of ventilation caused by inspiratory air flow resistance, and this impairment becomes progressively more pronounced as anesthesia deepens.

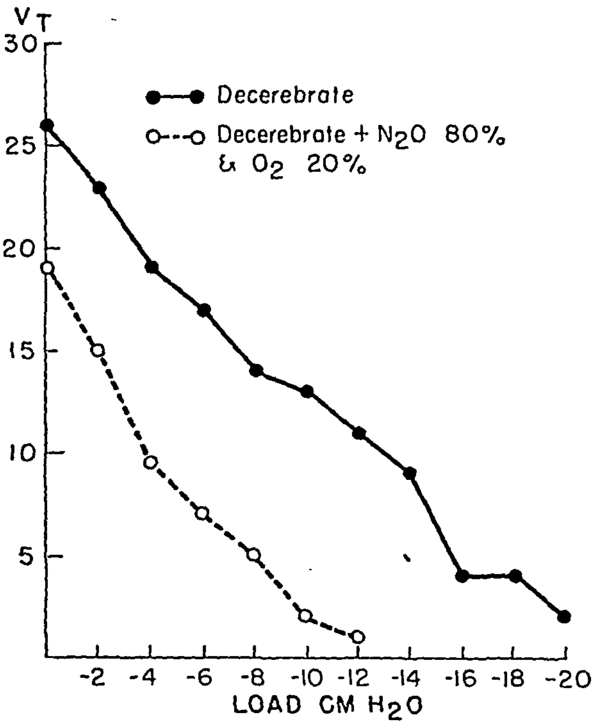


Fig. 4.—Effect of nitrous oxide on ventilation during inspiratory flow resistance, showing depression of tidal volume by anesthesia.

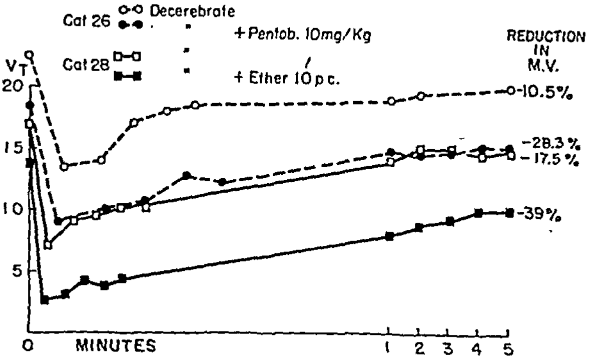


Fig. 5.—Inspiratory resistance of −12 cm. H_2O sustained for five minutes. During pentobarbital and diethyl ether anesthesia, depression of tidal volume by resistance was increased and recovery of minute volume delayed.

The effect of pentobarbital and diethyl ether anesthesia on the adjustment to sustained inspiratory resistance is shown in figure 5. The reduction in minute volume was much greater after the animals were anesthetized (see table). The higher respiratory rate with ether anesthesia apparently did not compensate for decreased tidal volume.

Comment

Relatively high resistances (6-15 cm. H_2O) were used in the sustained resistance experiments in order to produce significant disturbances in a short period of time. Similar but less marked responses were produced with lower resistances, even with the low resistances of clinical anesthesia apparatus. Figure 6 shows the effect on respiratory muscle activity of connecting a Heidbrink circle machine to the endotracheal tube of a patient anesthetized with nitrous oxide–oxygen and thiopental. Expiratory activity was increased, as shown by the rise of the electromyographic integral, and there was also a slight prolongation of inspiratory activity.

Effect on Ventilation of Inspiratory Resistance Maintained for Five Minutes

			Tidal Volume*		Respirations per Minute		Minute Volume*		
Cat, No.	Resistance, Load, Cm. H_2O	Anesthesia	Before Loading	After Loading	Before Loading	After Loading	Before Loading	After Loading	Change, %
25..............	—6	None	22	22	20.7	18.7	454	414	—8.8
		Pentobarbital, 10 mg./kg. of body weight	21	19.3	16	13.8	336	266	—21.7
26..............	—12	None	25	20	10.5	12	268	240	—10.5
27..............	—12	None	18.5	15	12.4	9.8	210	147	—28.8
		Pentobarbital, 10 mg./kg. of body weight	18	16.5	29.6	29.5	535	480	—10.5
		Pentobarbital, 10 mg./kg. of body weight	18	14	29.5	25.6	530	358	—32.5
28..............	—12	None	17	15	19.4	18	328	270	—17.5
		Ether, 10%	13.7	10	22.7	21.4	351	214	—39.0
29..............	—15	None	23	24	15	17	345	408	+18.0
		Ether, 5%	36	26	13.6	11.7	495	305	—38.5

* In arbitrary units of 1.5 ml.

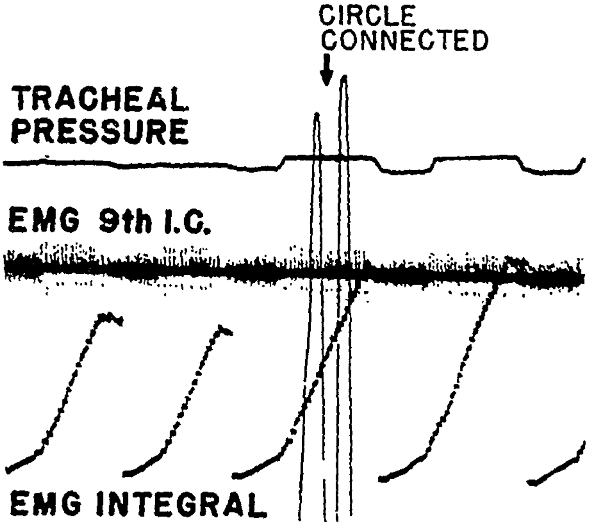


Fig. 6.—Ninth intercostal muscle activity during nitrous oxide–oxygen and thiopental anesthesia in man. At signal, circle machine was reconnected to endotracheal tube, resulting in increased fluctuations in intratracheal pressure *(upper trace)*, as well as prolongation of expiratory activity, shown by greater rise of electromyographic *(EMG)* integral *(bottom trace)*. There is also slight prolongation of inspiratory discharge.

Nitrous oxide is usually believed not to depress respiration,[3] although Seevers and Waters[4] have pointed out the dearth of quantitative observations concerning this gas and much of the early work on nitrous oxide anesthesia is vitiated by concomitant hypoxia. In our experiments, all the cats anesthetized with 80% nitrous oxide–oxygen (group 2) showed a diminished ability to inspire against an added resistance applied for a single breath. Arterial oxygen tensions were not measured, but, under the conditions of the experiment, any hypoxia would have been due to depression of ventilation by the anesthetic, since obstruction lasted for only one breath in each minute. The result would support the conclusion that nitrous oxide does, in fact, depress respiratory activity (fig. 4).

The stimulatory effect of light ether anesthesia on ventilation was observed in all the cats in group 3, chiefly as increased frequency of respiration, but, in spite of this stimulation, the animals' ability to overcome an inspiratory resistance was impaired (fig. 5) and the impairment became greater with each increase in the anesthetic vapor concentration.

From these experiments it appears that inspiratory resistance initially reduces the tidal volume and frequency of respiration and that the reduction in tidal volume is aggravated by pentobarbital, nitrous oxide, or ether anesthetic. If the flow resistance persists, there is a gradual recovery in the volume of ventilation, but even in the unanesthetized state this is not complete at the end of five minutes. This agrees with the findings of Zechman and co-workers [1] in man. Furthermore, the recovery rate is much slower during pentobarbital or ether anesthesia, indicating that the animal's compensatory mechanism was also disrupted to a certain extent.

Summary

The effect of added airway resistance on ventilation and respiratory muscular activity was studied in decerebrate cats before and during anesthesia. The ventilation was reduced with increased airway resistance in spite of augmented muscular activity.

The reduction of ventilation was proportional to the magnitude of the resistance. General anesthesia with pentobarbital, nitrous oxide, and ether aggravated this ventilatory disturbance; the impairment became progressively greater with deeper anesthesia.

630 W. 168th St. (32) (Dr. Fink).

This study was supported by a grant from the National Institutes of Health, U. S. Public Health Service.

References

1. Zechman, F.; Hall, F. G.; and Hull, W. E.: Effects of Graded Resistance to Tracheal Air Flow in Man, J. Appl. Physiol. **10**:356-362 (May) 1957.
2. Bigland, B., and Lippold, O. C. J.: Relation Between Force, Velocity and Integrated Electrical Activity in Human Muscles, J. Physiol. **123**:214-224 (Jan. 28) 1954.
3. Orth, O. S.: Anesthetic Gases, in Pharmacology in Medicine, edited by V. A. Drill, New York, McGraw-Hill Book Co., Inc., 1958, p. 70.
4. Seevers, M. H., and Waters, R. M.: Pharmacology of Anesthetic Gases, Physiol. Rev. **18**:447-479 (July) 1938.

MANUAL AND MECHANICAL CONTROL OF VENTILATION DURING CYCLOPROPANE ANESTHESIA

Mary R. Wester, M.D., LeRoy W. Krumperman, M.D., Esther M. Greisheimer, M.D.
and
James C. Erickson, M.D., Philadelphia

Respiratory factors that might be responsible for the appearance of cardiac arrhythmias during cyclopropane anesthesia were studied in 34 patients. Respiration was controlled manually in 15 cases and mechanically in 14; in 5 the control was manual in the beginning and mechanical later on. In the presence of such control, high blood levels of cyclopropane were quite compatible with adequate oxygenation as gauged by determinations of oxygen saturation, carbon dioxide tension, and pH. Electrocardiographic changes, interpreted as a shifting of the pacemaker toward the atrioventricular node, occurred repeatedly in five cases but were not associated with any noticeable cardiac irregularity. Distinctly palpable arrhythmias occurred in two patients; in one of these spontaneous respiration had been permitted early in the anesthesia and in the other there were indications of underlying cardiovascular instability. Under the conditions of this study hyperventilation was more frequent than hypoventilation. The evidence showed that cardiac arrhythmias perceptible by palpation should rarely occur when cyclopropane is administered with ventilatory control.

This study was undertaken originally to determine whether cardiac arrhythmias would occur consistently with cyclopropane anesthesia when respiration of the patient was controlled by the anesthetist. The respiratory depression usually caused by cyclopropane could be avoided by controlled ventilation. A comparison of manual and mechanical control of ventilation during anesthesia arose as an outgrowth of this study. Cyclopropane levels, oxygen content and capacity, carbon dioxide content and tension, and pH were determined in arterial blood prior to induction of anesthesia and at varying intervals during the course of surgery.

Materials and Methods

Thirty-four patients, ranging in age from 28 to 77 years, were selected at random for this study. With one exception, all underwent major intra-abdominal surgery. All but one were free from pulmonary symptoms and disease. Respiration was controlled manually in 15 cases and mechanically by a Jefferson ventilator in 14 cases; in five patients respiration was managed first by manual control and later by ventilator control. The electrocardiogram was monitored in 16 cases, and permanent tracings were made if any change in rate or pattern occurred. Control samples of arterial blood were drawn after

---

From the Department of Anesthesiology, Temple University Medical Center.

Read before the Section on Anesthesiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

the patients had been breathing oxygen at a high flow (8-10 liters per minute) on a semiclosed system for 15 to 30 minutes. Anesthesia was induced by injection of a small amount of thiopental sodium, and endotracheal intubation was facilitated by administration of succinylcholine chloride. Cyclopropane anesthesia was begun immediately after intubation. When the Jefferson ventilator was being used, aliquots of gas from the inhalation stream were drawn at the time of arterial sampling and analyzed in a Scholander apparatus for percentage of oxygen in the inspired gas. This was compared with the percentage of oxygen flowing from the gas machine.

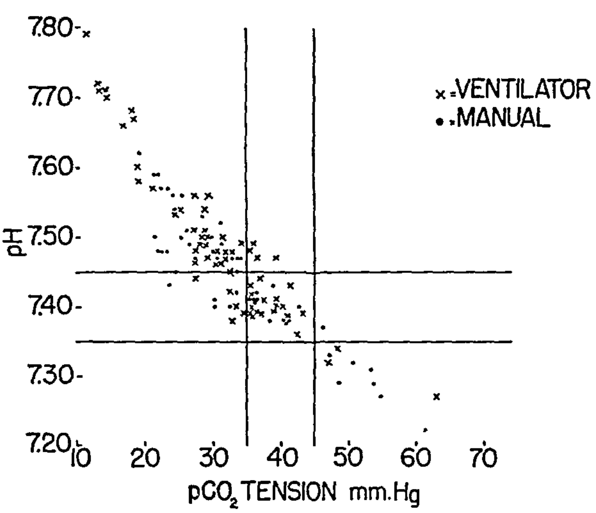


Fig. 1.—Incidence of hyperventilation and alkalosis with use of manually and mechanically controlled respiration during cyclopropane anesthesia.

Carbon dioxide and oxygen contents of arterial blood were determined on whole blood by the Van Slyke-Neill method,[1] modified for the presence of cyclopropane.[2] Cyclopropane level was determined by a method described previously.[3]

Results

In the majority of cases, there was a certain degree of hyperventilation with resultant alkalosis (fig. 1). This was more marked in the ventilator-controlled group. The carbon dioxide content of arterial blood decreased in each group but much more in the ventilator group. The mean carbon dioxide tension of plasma remained relatively steady in the manual and manual-ventilator groups but showed a pronounced drop in the ventilator group. Marked alkalosis (pH more than 7.55) was present in three cases when respiration was controlled manually and in five cases when ventilator control was used. Seven patients passed through periods of acidosis, but only two patients showed respiratory acidosis at the time of the last sampling. A graphic comparison of the findings in the manually controlled and the ventilator-controlled groups is shown in figure 2.

The control specimens of arterial blood were drawn after the patients had breathed 100% oxygen for 15 to 30 minutes. Despite this, the hemoglobin saturation with oxygen was frequently less than 100%. (Oxygen contents were corrected for oxygen dissolved in the plasma according to Comroe.[4]) The average control value was 97.3% saturation. Suboxygenation of control samples of arterial blood was apparently not the result of over-all hypoventilation, since plasma carbon dioxide tension was always within the normal range. It was more likely related to uneven alveolar ventilation and perfusion as the result of postural inactivity after premedication (fig. 3).

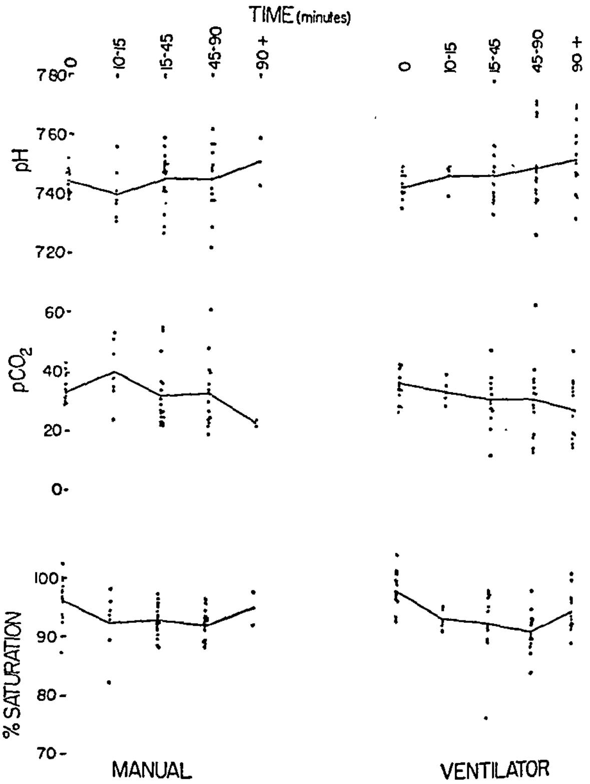


Fig. 2.—Comparison of findings in manually controlled and ventilator-controlled groups during cyclopropane anesthesia.

During cyclopropane anesthesia, the oxygen saturation tended to approach an average of 92% regardless of the type of ventilatory control. High blood levels of cyclopropane were not necessarily associated with poor oxygenation. In the latter part of our study, we determined the percentage of oxygen in the cyclopropane-oxygen mixture being delivered to the patient by the Scholander analysis.[5] As was expected, the oxygen concentration of the inspired gas was always less (average, 62.8%) than that calculated from the flow meter (average, 79.4%), since the inspired gas was diluted by recirculated gas from the rebreathing bag. When the Scholander analyses were carried out, the value for inspired oxygen concentration so obtained was used in correcting arterial oxygen content for dissolved oxygen in the plasma.

In 16 cases, the electrocardiogram was monitored and permanent tracings made at the time of arterial blood sampling. It was our original purpose to correlate the incidence of cardiac arrhythmias occurring during cyclopropane anesthesia with arterial blood levels of cyclopropane, oxygen, carbon dioxide tension, and pH. Assuming that arrhythmias might occur during deep anesthesia, we attempted to push anesthetic levels as deep as possible while monitoring the electrocardiogram for changes in rhythm. Respiration was controlled manually in eight cases and by the Jefferson ventilator in eight cases.

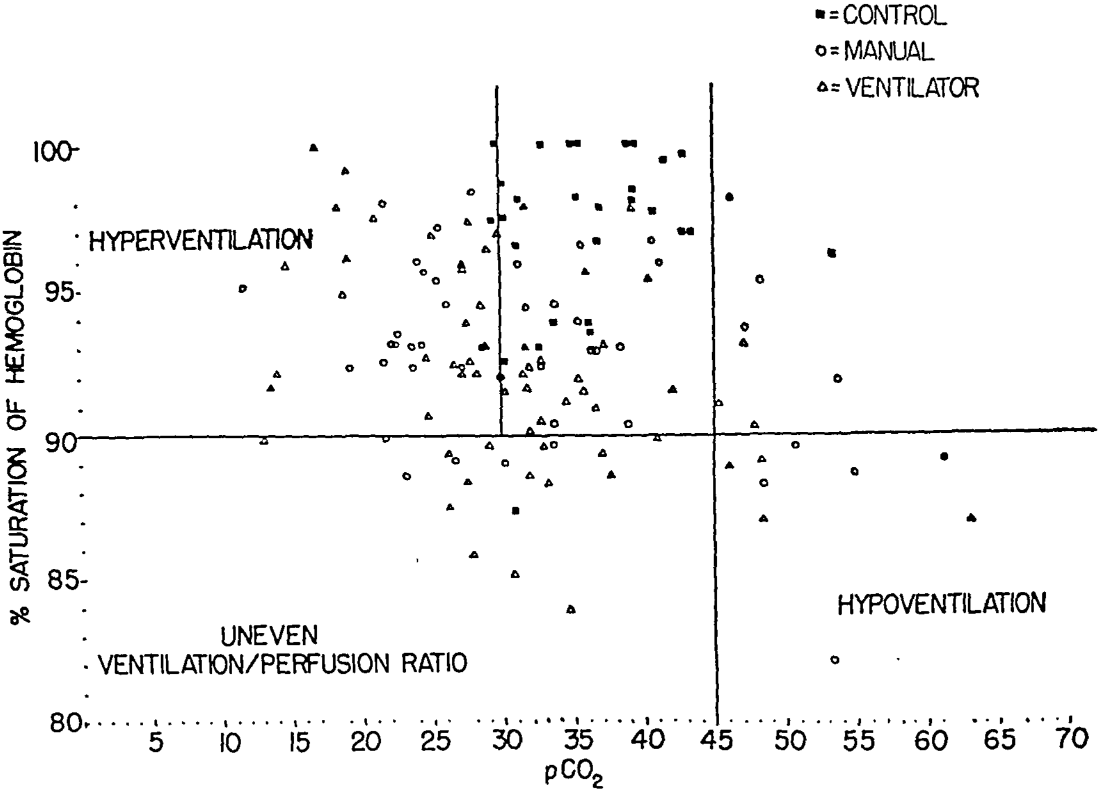


Fig. 3.—Ventilation and perfusion during cyclopropane anesthesia.

We found it impossible to provoke cardiac arrhythmias at will under these conditions when cyclopropane was administered by controlled ventilation. Deep anesthesia (cyclopropane level more than 15 mg. %) did not cause cardiac irregularities or consistent electrocardiographic changes, nor was light anesthesia a provocative agent.

The most common electrocardiographic alteration was an occasional shift of the cardiac pacemaker downward toward the atrioventricular node. This was unassociated with any noticeable cardiac irregularity and occurred repeatedly in five cases. It was unrelated to depth of anesthesia, although when it did occur lightening the anesthesia seemed to shift the pacemaker upward. There was a tendency for the arterial oxygen saturation to be moderately decreased at the time of the displaced pacemaker (89-92% saturation). Correlation with the clinical records of these five patients suggested that preexisting heart disease, momentary hypoxia or hypotension, or prior treatment with quinidine, digitalis, or thyroid extract contributed to the development of a wandering pacemaker during cyclopropane anesthesia.

In two cases distinctly palpable, potentially dangerous arrhythmias occurred. Frequent premature ventricular beats and bigeminy were noted on the electrocardiogram. One of these was the only case in which respiration was allowed to be spontaneous early in the anesthetic course, and respiratory acidosis (pH 7.29) together with moderately deep cyclopropane anesthesia existed at the time of the arrhythmia. Institution of manually controlled ventilation with return of the pH to 7.45 and slightly lighter anesthesia returned the electrocardiogram to normal. In the other case there was an unusually labile, elevated blood pressure. Arterial oxygenation was excellent throughout, and a constant respiratory alkalosis existed. The labile blood pressure and cardiac irregularity could not be explained. It might be assumed that delivery of oxygen to the myocardium was less than perfect.

Comment

Cyclopropane is a potent respiratory depressant, and its administration after that of preanesthetic drugs may result in hypoventilation, notably causing carbon dioxide retention, respiratory acidosis, and, occasionally, suboxygenation despite a high oxygen mixture. Control of respiration can be readily established either manually or mechanically, and respiratory acidosis can be avoided. Vigorous control of respiration will produce respiratory alkalosis by washing out carbon dioxide. We found overventilation to be more common than underventilation when artificial respiration was used.

The low carbon dioxide tension of respiratory alkalosis favors a more tenacious binding of oxygen and hemoglobin, whereas a high carbon dioxide tension favors dissociation of oxyhemoglobin.[6] We have not found clinical evidence that hyperventilation with respiratory alkalosis to the degree seen in these cases is harmful to the anesthetized patient. This corroborates the findings of other investigators.[7] The circulatory status of these patients was stable in most instances, and variations which did occur were apparently unrelated to respiratory control. Since carbon dioxide is a potent vasodilator, it has been suggested that coronary vasoconstriction may follow its decrease in the blood by hyperventilation.[8] In the present study, respiratory alkalosis was not associated with consistent electrocardiographic changes. If alkalosis was sufficient to produce coronary vasoconstriction, it was not so severe as to produce myocardial ischemia in the presence of the oxygen concentrations employed. Recovery from anesthesia was prompt in all cases, and there was no clinical evidence of cerebral impairment as a result of altered acid-base balance and cerebral circulation.

Despite hyperventilation sufficient to produce respiratory alkalosis, arterial blood oxygenation may be unexpectedly low because of uneven ventilation and perfusion of the lungs. In this study, when the inspired gas mixture contained 80% or more oxygen by the Scholander analysis, the uncorrected oxygen content of arterial blood was invariably greater than the oxygen capacity, indicating considerable oxygen dissolved in plasma. When the inspired oxygen concentration was 55% or less, the uncorrected oxygen content was less than the oxygen capacity, indicating hemoglobin unsaturation. Nahas and co-workers[9] showed that hemoglobin saturation was significantly less than 100% when healthy male subjects breathed 40, 50, and 60% oxygen. Our figures roughly corroborate these findings. Inspired gas oxygen concentration of 70% or more should yield arterial oxygen tensions of more than 400 mm. Hg; at this level uncorrected arterial oxygen content was usually higher than oxygen capacity.

Direct oxygen tension measurements in the presence of gaseous anesthetic agents are difficult and, as yet, not perfected. The most reliable means yet devised for determining relative difference in oxygen saturation at oxygen tensions more than 100 mm. Hg is by oximetry. The oxygen saturations calculated from the tonometric determinations of oxygen capacity give results which are about 2% below the values of oxygen saturation as determined by oximetry.[9]

Summary

Controlled ventilation during cyclopropane anesthesia by either manual or mechanical means usually produces hyperventilation and respiratory alkalosis. Oxygenation of arterial blood may be less than 100% even in the presence of hyperventilation if there is uneven ventilation and perfusion of the lungs. Cardiac arrhythmias perceptible by palpation rarely occur when cyclopropane is administered with ventilatory control. Downward displacement of the cardiac pacemaker as seen on the electrocardiogram may represent myocardial depression by cyclopropane superimposed on preexisting myocardial disease or drug therapy.

3401 Broad St. (40) (Dr. Wester).

Dorothy W. Ellis provided technical assistance and Dr. William L. Winters reviewed electrocardiographic records for this study.

References

1. Van Slyke, D. D., and Neill, J. M.: Determination of Gasses in Blood and Other Solutions by Vacuum Extraction and Manometric Measurement, J. Biol. Chem. **61**:523-573 (Sept.) 1924.

2. Goldstein, F.; Gibbon, J. H., Jr.; Allbritten, F. F., Jr.; and Stayman, J. W., Jr.: Combined Manometric Determination of Oxygen and Carbon Dioxide in Blood, in Presence of Low Concentrations of Ethyl Ether, J. Biol. Chem. **182**:815-820 (Feb.) 1950.

3. Greisheimer, E. M., and others: Cardiac Output by Cuvette Oximeter Under Cyclopropane-Oxygen Anesthesia, Am. J. Physiol. **177**:489-492 (June) 1954.

4. Chemical Methods for Measuring Blood Oxygen Content and Saturation, in Methods in Medical Research, edited by J. H. Comroe Jr., vol. 2, Chicago, Year Book Publishers, Inc., 1950, pp. 141-144.

5. Scholander, P. F.: Analyzer for Accurate Estimation of Respiratory Gases in One-half Cubic Centimeter Samples, J. Biol. Chem. **167**:235-250 (Jan.) 1947.

6. Bohr, C.; Hasselbalch, K.; and Krogh, A.: Über einem in Biologischer Beziehung wichtigen Einfluss, den die Kohlensäurespannung des Blutes auf dessen Sauerstoffbindung übt, Skandin. Arch. f. Physiol. **16**:402-412, 1904.

7. Stephen, C. R.; Fabian, L. W.; Dent, S.; and Bourgeois-Gavardin, M.: Hypoventilation and Hyperventilation During Anesthesia for Thoracic Surgery, J. A. M. A. **166**:1678-1684 (April 5) 1958.

8. Christensen, B. C.: Studies on Hyperventilation: II. Electrocardiographic Changes in Normal Man During Voluntary Hyperventilation, J. Clin. Invest. **25**:880-889 (Nov.) 1946.

9. Nahas, G. G.; Morgan, E. H.; and Wood, E. H.: Oxygen Dissociation Curve of Arterial Blood in Men Breathing High Concentrations of Oxygen, J. Appl. Physiol. **5**:169-179 (Oct.) 1952.

FACTORS TO BE CONSIDERED IN PLANNING A REHABILITATION SERVICE

Helen M. Wallace, M.D.
and
Frederic J. Kottke, M.D., Minneapolis

A rehabilitation service might reasonably be expected to carry out at least three functions: patient care, research, and training of professional personnel of all types. The advantages of location in a general hospital include the ready availability of all types of medical specialists and consultants; provision of both inpatient and outpatient care; avoidance of duplication of certain types of facilities; the possibility of earlier referral of patients; better dissemination of knowledge concerning rehabilitation; the possibility of the wider use of rehabilitation principles in the care of other patients within the general hospital; and the provision of surgical services in the same hospital in which the rehabilitation service is located. Unless a plan is made and carried through for the patient's continuing care and supervision, frequently he may receive little or no aftercare and may regress. Until more knowledge is available regarding primary prevention of many chronic diseases in both children and adults, rehabilitation services will be needed.

With the accumulation of new knowledge regarding techniques for the rehabilitation of patients with handicaps, many communities both in the United States and elsewhere are developing or planning to develop new "rehabilitation services." As with any relatively new field, there is agreement concerning some aspects of rehabilitation services and lively discussion about other aspects. Because in most communities there is a limitation of both funds and trained personnel, sound planning is essential in order that the available funds and personnel may serve the greatest number of patients most effectively. It is the intent of this paper to describe briefly some of the factors and principles to be considered in planning a rehabilitation service, as a guide for persons or for a community contemplating the development of such a service.

Functions and Location of a Rehabilitation Service

Functions.—A rehabilitation service might reasonably be expected to carry out at least three functions: 1. Patient care. This includes such phases as evaluation, diagnosis, treatment, vocational restoration, and continuing long-term care and supervision, on both an inpatient and outpatient basis. This primary function should include the evaluation of the results of the rehabilitation both of individual patients and of groups of patients. 2. Research. Especially to be noted is the area of experimentation with new methods and techniques of rehabilitation and of the evaluation of such experimentation. 3. Training of professional personnel of all types. This includes medical personnel (especially physiatrists, pediatricians, and internists), nurses (both hospital and public health), physical, occupational, and speech therapists, psychologists, vocational counselors, social workers, recreation workers, and others.

Location.—One of the controversial issues is that of location of the rehabilitation service. Possible locations include the development of (1) a rehabilitation service in a general hospital, (2) a rehabilitation service in a specialty hospital, such as that for orthopedic surgery, chronic disease, or otolaryngology, and (3) a completely separate rehabilitation "center." While we are in favor of the location of the rehabilitation service within the general hospital, we recognize that local circumstances may favor its development in another location.

The advantages of location in a general hospital include the ready availability of all types of medical specialists and consultants; provision of both inpatient and outpatient care; avoidance of duplication of certain types of facilities, such as laboratory or x-ray services; the possibility of earlier referral of patients in the general hospital for rehabilitation, because the rehabilitation service is an integral part of the general hospital; better dissemination of knowledge concerning rehabilitation to other members of the general hospital staff, both medical and nonmedical; the possibility of the wider use of rehabilitation principles in the care of other patients within the general hospital; the specific assignment of individual physicians from other services of the hospital, so that responsibility is fixed and so that there may be cross-fertilization of ideas regarding patient care; and the provision of surgical services in the same hospital in which the rehabilitation service is located, so that there may be some continuity of care prior to and immediately after the surgical phase.

From the University of Minnesota School of Public Health and the Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School.

In the event that location within a general hospital is not possible, steps should be taken to assure the same quality of medical and health care as would be provided there. These steps include medical direction by a qualified physiatrist, preferably on a full-time basis; the provision, assignment, and easy availability of other medical specialists; a close working relationship with all other hospitals of the community, so that patients will be referred early to the rehabilitation service; when surgery is indicated, the working out of a careful plan with the surgical staff regarding timing, responsibility for joint supervision of the patient, continuity of care, and other factors; and provision of both inpatient and outpatient care and a unity system of records, so that continuity of care will be fostered. Also, a preferable location would be in a facility used for teaching purposes for the undergraduate and postgraduate training of professional personnel.

At the state level, thought should be given not only to planning for the rehabilitation service's location within the state capital or the central city but also to providing for regional or district rehabilitation services to meet the diagnostic, treatment, follow-up, and supervision needs on a long-term basis. This means, then, planning the services geographically so that they will be easily available to all citizens of the state on a regional or district basis.

A completely planned rehabilitation program must include local medical, nursing, social, and vocational counseling services to assist the handicapped patient in his return to normal community living. After the initial readjustment, some handicapped persons require little additional help. Others may need assistance and counseling for a long time before they achieve independence. The rehabilitation team in the local community can initiate the rehabilitation program for a handicapped patient early in the course of the disease, handle the entire rehabilitation program of the patient with less involvement, and be available to supervise and assist when the patient returns home again.

At the local level, other factors may warrant consideration in deciding on location. For example, the presence of a school for handicapped children, of a housing project with a fair number of handicapped people, or of a sheltered workshop may make it desirable to locate the rehabilitation service nearby for the convenience of these patients in order to reduce transportation costs and facilitate continuity of care.

Types of Patients

One of the basic decisions to be made is that regarding the types of patients to be cared for in the rehabilitation service. Is the service to be used for one or a few diagnostic types of patients, or is it to be used for all types of handicapped patients? On this basic decision will depend such essential aspects as the plan for the physical plant and staff. Both patterns have been used in the United States, and it is our opinion that, where a service is developed for patients with a variety of conditions, it is more likely to be of higher caliber, it can have a more complete staff, it is possible that the cost per patient will be lower because a reasonably complete staff can be provided, and more patients in the community are likely to be served. However, these are empirical observations, and objective studies of both methods are necessary.

Where a service is developed for one or a few diagnostic groups only, those patients included are likely to receive more concentrated care in a limited way. For example, the development of special separate services for patients with cerebral palsy has undoubtedly resulted in better care than previously existed; however, the provision of such separate services has usually meant that an ophthalmologist is rarely provided as a staff member of the cerebral palsy program. It has also meant that the hearing aspects of diagnostic and therapeutic care are frequently forgotten, overlooked, or, when provided, inadequate in quality. It is thought that the provision of a rehabilitation service for a larger number of diagnostic groups of patients will mean that all essential aspects of patient care will be considered for all patients.

In this connection, the question frequently is raised regarding the advisability of providing separate rehabilitation services for children and adults. Reasons advanced for the separation of children's services include the facts that children's needs are different and that the children's service may be of inferior quality because it may be overshadowed by the adult service. In our opinion, separation is unnecessary and may be undesirable because of the possibility of duplication of services and wastage of available funds and personnel. We believe that, if some program modifications can be made, it is more desirable to have the children's and adults' services together. These modifications include the need for staff understanding of the physical and emotional growth and development of children, the inclusion of a pediatrician on the staff, the provision of equipment of a size appropriate for children, consideration of children's educational and vocational needs, and the employment of a clinical psychologist who has had training and experience in working with children.

The Staff

There is general agreement that a multidisciplined staff is essential for a rehabilitation service. The composition of the staff to a certain extent is determined by the type of patients to be cared for. In a service caring for a wide variety of types of patients, personnel considered essential are as follows: the medical staff (especially the physiatrist, pediatrician for children, internist for adults, psychiatrist, ophthalmologist, orthopedic surgeon, cardiologist, surgeon, otologist, neurologist, and urologist); the nursing staff (staffs of both the institution and the community public health nursing agency); social service; dental and orthodontic service; therapists (physical, occupational, and speech); the psychologist: the vocational counselor; the audiologist; the recreation worker; technician services (laboratory, x-ray, electroencephalographic, and orthoptic); and the teacher.

It is evident that the list is long and that the cost of a reasonably complete service is high. The many facets of patient care—medical, social, psychological, educational, vocational, and recreational—must be considered together if the patient is to be assisted as a whole person. This means that the staff members must be provided with an opportunity and must be able to work together as a team or unit. If the team effort is not used, it may mean that the patient may be shunted from one staff member to another, timing of services may be incorrect, some available services may actually not be used for a patient, and the total essential needs of the patient and his family may not be considered.

One other aspect of the subject of the staff of the rehabilitation service merits discussion: direction of the service. There is general agreement that a full-time director is essential. Two patterns of directorship of rehabilitation services have developed in the United States: (1) the physician as full-time director and (2) a nonmedical staff member as full-time director, with the physician as full-time or part-time medical consultant. It is our opinion that the full-time director should be a physician—one who is interested and trained in the field of rehabilitation. Reasons for the need of a full-time medical director include the fact that there are primary medical and health needs of patients requiring rehabilitation which must be met and that, if the physical handicap can be eradicated or minimized, the vocational potential will be increased. Reasons advanced for the employment of nonmedical directors include the fact that it may be difficult to secure a physician on a full-time basis and that sometimes physicians are not as competent as administrators and are not as able to foster the carrying out of the team concept as other professional personnel. In any event, whichever plan is adopted, it is our belief that the full-time participation of at least one physician is essential and that the medical and health needs of the patient must receive careful consideration in addition to the patient's other needs—social, psychological, educational, vocational, and recreational.

The handicapped patient has been referred to the rehabilitation facility to undergo any intensive program of maximum restoration in order that he might return home as independent and self-sufficient as possible. The rehabilitation center, in planning for this goal, should include the family physician in the conferences and planning regarding the patient. From the family physician the center can obtain the record of the patient's previous health. When the patient has completed his rehabilitation program he will return home and again be cared for by his family physician. If the family physician participates with the rehabilitation team during the rehabilitation program, he has a better understanding of the patient, his problems, and his potential and is better prepared to resume his care when he returns home.

The Program

While it is impossible in this paper to discuss all aspects of the program, certain areas of significance will be selected. It would be expected that each patient would be evaluated by the team on admission to the rehabilitation service, either as outpatient or as inpatient, and that the team members would discuss and make a plan for the patient. It would be expected that some one team member would be selected to interpret carefully the findings and recommended plan to the patient, his family, or both. Furthermore, it would be expected that the patient would be periodically reevaluated, perhaps every three to six months, in order that his program may be modified as indicated by his condition; this should apply to patients within the inpatient as well as the outpatient service. The reasons for periodic reevaluation of patients include the necessity of changing the program as the patients' needs change and the importance of a concerted effort to reduce unnecessary inpatient care when it is no longer warranted by the patients' condition, with its resultant reduction in patient costs and freeing of facilities for other patients.

Several methods exist for team functioning; included are the periodic team staff conference and the periodic team rounds. The former is usually conducted weekly and the latter daily but on a more abbreviated basis. All staff members attend and participate in the weekly staff conference, when, usually, service problems are discussed, policy decisions made, and certain patients reviewed (new admissions, those considered for discharge, those due for periodic review, and those with special problems). Many of the staff members attend daily rounds when the majority of patients are reviewed.

Surveys have indicated the importance of integrating the instruction given to patients in the various therapy departments with their activities during he rest of the day on the inpatient service. For example, if a patient is learning ambulation in the physical therapy unit, he should be given assistance and an opportunity to continue this when he is back in the floor nursing unit. This same principle applies to many other patient activities—dressing, toilet care, feeding, speech, tooth brushing, and others. In order to facilitate this, personnel employed in the floor nursing unit (nurses, attendants, and orderlies) must have reasonably good general technical skills and must have an intimate knowledge of the therapy program for each patient. It also implies a fundamental shift in concept of patient care on the part of personnel employed in the floor nursing unit from that of passive bed care to that of the patient's active participation in his own care.

Another aspect is integration of the vocational program with the other aspects of patient care—medical and health, social, psychological, and educational. This means that a vocational counselor will be an integral part of the staff of the rehabilitation service, actively participating in patient care with all teen-aged youths and adults known to the service. It also means that, whenever possible, the various steps of testing, guidance, training, and placement, as well as the sheltered workshop, should be a part of the rehabilitation service. Where the vocational aspects have not been so integrated, several undesirable results in patient care may occur—either there may be delay in referral of patients to the vocational agency or the vocational agency may be placed in the position of attempting to do testing, guidance, training, and placement without an adequate knowledge of the patient's physical and mental condition and capacity.

Patient records are essential, not so much in themselves but because they represent the one tangible source of description of the patient's course and response to the rehabilitation process, in contrast to dependence on man's memory and changing personnel. Thus, the patient's record should give a reasonably complete picture of himself and his family on admission, throughout his course, and at the time of separation from the service. The record should contain not only the medical and health data but also information regarding the patient's social, psychological, educational, and vocational status—both on an inpatient and on an outpatient basis. The data should be collected in a uniform manner on all patients, so that results in patient care may be analyzed.

Physical Plant

Special features of the physical plant include the floor nursing unit with nonskid floors, special bathroom facilities for easy wheel chair-to-toilet transfer, special kitchen facilities for teaching self-help, and service areas to be used jointly by the inpatient and outpatient services, including physical therapy, occupational therapy, speech therapy, psychological testing, and the vocational assistance areas with the sheltered workshop, in addition to offices for key personnel.

Ramps are considered essential where there is a change of floor elevation. Special unloading and reception areas for transportation vehicles are helpful. Where teachers are provided for children on inpatient services, classrooms are necessary.

Continuing Care of the Patient

Discharge planning and arrangements are an important step in the patient's rehabilitation. They include consideration of the family attitude, home conditions, details of the patient's continuing care and supervision, education of patients of school age, vocational guidance of youth and adults, and transportation. This discharge planning, to be effective, cannot take place only at the time of discharge. It must occur early and throughout the patient's rehabilitation course by maintaining close contact with the family, helping the family to accept the patient back into their family unit, assisting them with planning the details of the patient's 24-hour care at home if homebound, and planning facilities and equipment for such items as toilet care, wheel chair activities, and bathing. Frequently, both the social worker and the public health nurse play key roles, the former by close family contact within the rehabilitation service and the latter by working with the family at home. One of the crucial periods in the home care of the homebound patient is the first few days after the patient's discharge from the inpatient service—from the viewpoint of both the patient and his family. This particular period of stress is when some extra guidance and supportive services can be of great assistance until the adjustment within the home is made.

Unless a plan is made and carried through for the patient's continuing care and supervision, frequently he may receive little or no care and will regress. For this reason, details of the plan should be worked out prior to discharge and then carefully interpreted to the patient and his family. Periodic close supervision for the patient who is moderately to severely handicapped is essential. For the homebound patient, many communities have now worked out organized home care programs whereby the team of services is brought to the patient at home as he needs them. Organized home care programs have stemmed from a hospital, a medical school, a voluntary public health nursing agency, and a health department; it seems likely that they might stem from a rehabilitation service as well.

For the handicapped patient with a vocational potential, vocational evaluation and planning should be begun early in his rehabilitation program. In addition to psychological testing, prevocational evaluation may be desirable prior to placement in a vocational school or on the job. Many severely handicapped persons have had no work experience or have not been employed for many months. Their living habits are unsuitable for the demands of an occupation. A prevocational evaluation unit can provide a practical situation to check punctuality, personal cleanliness and neatness, ability to work with and tolerate others, speed and carefulness in work, and maintenance of interest in work. In the prevocational evaluation clinic, the level of ability of the patient can be established. The vocational counselor who has had an opportunity to work with a patient in his prevocational evaluation can place him with assurance of his level of performance.

Vocational placement of handicapped persons is usually a stressful situation. Most employers have some reservations about a handicapped employee. Plant physicians feel the personal insecurity that in accepting a handicapped employee they may be open to criticism if an accident occurs. Agents for workmen's compensation insurance generally warn employers that they may be incurring increased risks and rates if they employ handicapped persons, even though all available statistics are contrary to this opinion. For this reason, the vocational counselor who makes the placement must make follow-up calls and visits to the employer and employee to see that the adjustment to the job and the performance of the job are satisfactory. For the employable patient, successful employment is the goal. None of the rehabilitation team, physician, therapist, counselor, or agency, can consider that a successful job of rehabilitation has been accomplished until the patient is satisfactorily employed.

Relationship to Other Community Agencies

On a cooperative basis, a rehabilitation service can carry out some other significant community functions. For example, in the case of adults, it can provide evaluation and diagnostic work for all patients applying for public assistance under the aid-to-the-disabled category and it can include in its rehabilitation program those patients found able to be rehabilitated. It can provide a similar service for youth and adults applying for vocational assistance under the state official vocational rehabilitation program. These two steps alone would mean earlier and more complete patient care with better results—and probably a considerable saving in tax funds. Similarly, the rehabilitation service can work cooperatively with the official crippled children's agency in reviewing the status of applicants for inpatient care and for special educational placement, such as home instruction, special schools, and special classes.

As public health programs begin to accept their responsibility in the chronic disease field, the need for public health personnel to receive training in this field will become more apparent. Here, too, the rehabilitation service is in a strategic position because of the training it can provide for health officers, public health nurses, nutritionists, and health educators.

Summary

A rehabilitation service should be located in a general hospital and care for many types of handicapped patients rather than limit the service to one or a few diagnostic groups. A full-time director, preferably a physiatrist, is desirable. Some aspects of the program include staff rounds and conferences, integration of therapy activities with the rest of the patients' care, integration of the vocational aspects into the other facets of rehabilitation, and recording of data. Continued care after discharge from the inpatient program is important.

Until more knowledge is available regarding primary prevention of many chronic diseases in both children and adults, rehabilitation services will be needed. The ultimate role which a rehabilitation service plays in the care of patients in a community will depend to a large extent on the soundness of the original planning and the staff's and community's concept of what it has to offer. Some of its role is also dependent on adequate financial support from the community, especially for the employment of the many kinds of professional personnel necessary in rehabilitation of patients.

CLINICAL NOTES

CYTOMETER CHAMBER SPERMATOCIDAL TEST

AN IMPROVED TECHNIQUE FOR EVALUATING SPERMATOCIDAL ACTIVITY

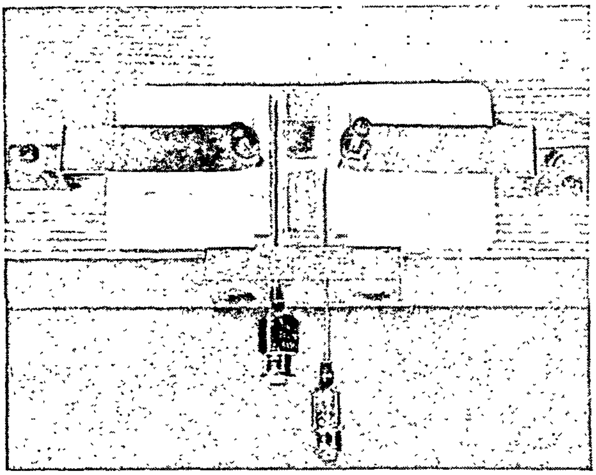
Dicran A. Berberian, M.D., Loudonville, N. Y.
and
Ralph G. Slighter, A.B., Rensselaer, N. Y.

Tests which measure the time required for varying concentrations of test substances to completely immobilize all spermatozoa in a given volume of spermatic fluid have been used in evaluating the relative spermatocidal activity of these substances.[1] Such dilutions are useful for measuring the intrinsic potency of an active ingredient in terms of minimal spermatocidal concentration, but the degree of homogenization required to provide reproducible results has no counterpart in coitus, and the relatively high values obtained are not applicable to defining the spermatocidal activity of contraceptive gels under conditions of use.

In order to approach normal conditions Gamble[2] devised a "diffusion test" for evaluating the spermatocidal activity of undiluted contraceptive products. The Gamble procedure utilizes glass tubing 2 cm. in length with an internal diameter of 2 mm. in which a column of semen is brought into contact with a column of undiluted contraceptive jelly, cream, or suppository mass. The observer measures the *time required at 37 C for immobilization of* spermatozoa in the sperm column as a result of diffusion of the active ingredients. The relatively small interface and long columns of materials result in prolongation of the time required for complete immobilization.

From the Research Laboratories of Esta Medical Laboratories, Inc., Rensselaer, N. Y.

The diffusion procedure has been usefully modified by use of a Spencer "Bright-Line" hemacytometer instead of a capillary tube, with resultant reduction of time required for immobilization and a gain in reproducibility. The test procedure is described below, and the results are compared with those obtained by the capillary tube method in tests conducted concurrently on the same samples of semen and spermatocides. The test procedure was greatly facilitated by use of a newly devised cytometer holder, which is described.



Hemacytometer and cover glass secured in holding device. Needles inserted into lateral moats through holes in brass template for purpose of orientation.

Materials and Method

The Spencer "Bright Line" hemacytometers, with improved double chamber and cover glasses, were used. The platforms of the six chambers used in this study varied from 6.0 to 6.2 mm. in width and were separated from each other by a moat 3.1 to 3.6 mm. wide. The cover glasses measured 19.1 to 19.8 mm. in width; hence, the length of platform covered was within that range, less the width of the moat. When the space between the platform and cover glass was filled with semen and the moats were filled with a spermatocidal preparation, the interface available for diffusion was 44 to 44.8 mm. in length by 0.1 mm. in depth, or 4.4 to 4.48 sq. mm. in area. The total volume of semen under observation was approximately 4.8 cu. mm.

Displacement of the cytometer cover glass during filling of the moats was avoided by use of the holding device illustrated in the figure. The holder consists of a wooden block equipped with a pair of adjustable spring clamps so spaced as to provide a downward thrust of the screws to hold the cover glass firmly in position when the cytometer is in place. The front of the block is provided with a brass template, 37 by 19 by 6 mm., through which holes have been drilled. These holes just permit passage of a 22-gauge hypodermic needle into each of the lateral moats of a cytometer slide. This device supports and guides the needle without risk of accidental displacement and facilitates uniform distribution of the injection mass.

Test Procedure.—The cover glass is held firmly in position and semen is run onto the open ends of the platforms until the areas under the cover glass are completely filled without overflow. The barrel of a tuberculin syringe fitted with a 22-gauge straight needle is filled with the spermatocidal preparation. The needle is then inserted through the brass template into one lateral moat, and the area of the moat under the cover glass is filled as the needle is slowly withdrawn along the moat until the transverse moat is reached. The needle is halted at the open edge of the transverse moat with the needle opening directed toward the moat and the material is extruded until the transverse moat is completely filled; the remaining portion of the lateral moat is then filled as the needle is slowly withdrawn. The other lateral moat is completely filled with the test material in the same manner. Both ends of the cover glass and the ends of both lateral moats are sealed with petrolatum jelly to prevent concentration by evaporation. Microscopic examination for evidence of motility of spermatozoa is started as soon as the preparation is completed and is continued at frequent intervals. Spermatocidal time is recorded as the time from the filling of the moats with the contraceptive material until all spermatozoa under the cover glass, in both chambers, have been immobilized at room temperature (74 to 78 F).

Gamble's capillary tube diffusion test and the cytometer chamber test procedure were used concurrently to determine the spermatocidal times of several commonly used contraceptive products and a new formulation (Lanesta gel) designed for the same purpose. The products in the accompanying table are listed in increasing order of their respective mean spermatocidal times. Spermatic fluids were provided by six young healthy donors aged 23 to 37 years. Ejaculates were submitted early in the morning and used within one to four hours of submission. On any one day only one specimen of spermatic fluid was usually used, as from one to four tests were run on each contraceptive preparation. Several samples of spermatic fluid were obtained from each donor over a period of weeks. Inasmuch as specimens differed from source to source and even ejaculates from the same donor were not always comparable in respect to percent-

In Vitro Spermatocidal Activity of Six Contraceptive Jellies

	Cytometer Chamber Spermatocidal Test		Gamble Capillary Tube Test	
Jelly	No. of Tests	Mean Spermatocidal Time ± S.E., Min.*	No. of Tests	Mean Spermatocidal Time ± S.E., Min.*
A†	40	31.9±0.7	28	50.6± 2.3
B	41	90.0±2.8	49	206.1±11.9
C	50	104.0±6.0	61	217.3±12.1
D	36	110.6±3.6	53	236.3± 9.5
E	28	174.0±7.3	53	262.7±11.8
F	28	259.1±9.8	51	313.3±10.3

* S.E.=standard error of the mean.
† Lanesta gel.

age of viability and degree of motility of spermatozoa, each specimen of spermatic fluid was tested at the same time by both methods and against each preparation in order to compensate for differences which might result from the testing of different ejaculates. Each contraceptive was tested as many as 28 to 50 times by the cytometer chamber procedure and 28 to 61 times by Gamble's capillary tube diffusion procedure.

Results.—By the cytometer chamber diffusion test the new spermatocidal formulation, jelly A (Lanesta gel), immobilized spermatozoa in one-third the time required for any of the three other most active products (jellies B, C, and D), and in one-fifth the time required for jelly E and in one-eighth the time required for jelly F. The absolute figures for each are given in the table in terms of mean spermatocidal times. By Gamble's capillary tube test, jelly A demonstrated a correspondingly wide margin of superiority over the other products tested.

Comment

The use of procedures for measurement of spermatocidal time which involve dilution and/or mixture of contraceptive with spermatic fluid is unsatisfactory because neither the required degree of mixing nor the extent of dilution has any counterpart under conditions of use. Moreover, reproducibility is difficult to achieve in tests which require mixing but do not require dilution. In Davidson's test[3] spermatozoa cannot be readily seen except in certain irregular areas, because of the opacity of some preparations; also this test requires the use of nonviscous semen. By the Sander-Cramer[4] and Millman[5] saturation tests, the time element for mixing of jelly and semen, preparation of slide, and examination of several fields under the microscope is so short (20 seconds) that duplication of test results is difficult and subject to wide variation. In addition, these tests often require several milliliters of semen per test, depending on the activity of the preparation. Thus, repetition of the test and simultaneous comparison with other preparations using the same ejaculate is seldom possible. The authors of these tests recommend the use of nonviscous spermatic fluid and admit that results are not always reproducible with "sticky" samples. Millman's "zone" test[5] claims to measure the penetration of spermatozoa into the contraceptive preparation. Gamble[2] pointed out in discussing Millman's procedure that the high dilutions used in the zone test and the short distances traversed by spermatozoa indicate that penetration into undiluted jelly or cream is nonexistent or minimal. By direct methods of observation, such as the present cytometer chamber spermatocidal test method, in which it is possible to observe every single spermatozoon in the preparation, we have never observed active penetration of spermatozoa into any undiluted contraceptive.

There is no factual basis for the assumption that there is any marked degree of dilution of a contraceptive in the vagina by vaginal secretions. The average volume of vaginal secretion after copulation was postulated[1] to be approximately 1 ml., whereas the usual volume of contraceptive jelly or cream that is introduced into the vagina is 5 ml.; therefore the greatest possible source of dilution is seminal fluid, which rarely exceeds 5 to 7 ml. Under these conditions, dilution of jelly or cream is likely to be 1:1 or maximally 1:2. Also, contraceptive preparations are characteristically either hydrophobic, because of fatty ingredients in the formula, or they are gelled with gums which are not readily miscible and which require time for imbibition of water. In view of the fact that spermatozoa cannot be depended on to actively penetrate into a jelly or cream, the best alternative to thorough mixing by artificial methods is dependence on diffusion of spermatocidal constituents into the spermatic fluid. The cytometer diffusion procedure described herein offers a convenient, reproducible method of measuring this diffusibility and of predicting the clinical effectiveness of a contraceptive jelly, cream, or suppository mass.

Summary

A new test procedure, designated the cytometer chamber spermatocidal test, for determining the speed of spermatocidal action of contraceptive products is a modification of Gamble's diffusion test, with use of a double chamber hemacytometer instead of capillary tubes.

The new test procedure is simple to carry out. The range of variations from one test to another falls within narrower limits than the Gamble diffusion test. The over-all time required for spermatocidal action is shorter by the new procedure than by the Gamble test.

A new contraceptive formulation was found to immobilize human spermatozoa in one-third to one-eighth the time required by five of the leading contraceptive products currently available.

389 Loudonville Rd. (Dr. Berberian).

Mr. K. T. Krantz helped to devise the cytometer holder.

References

1. Baker, J. R.; Ranson, R. M.; and Tynen, J.: Spermicidal Powers of Chemical Contraceptives: Approved Tests, J. Hyg. **37**:474-488 (July) 1937. Brown, R. L., and Gamble, C. J.: Method of Testing Relative Spermicidal Effectiveness of Contraceptives, and Its Application to 10 Commercial Products, Human Fertil. **5**:97-108 (Aug.) 1940. Becker, B., and Gamble, C. J.: Spermicidal Times of Contraceptive Jellies and Creams, 1946, ibid. **11**:111-115 (Dec.) 1946.

2. Gamble, C. J.: Improved Test of Spermicidal Activity Without Dilution or Mixing: Report to Council on Pharmacy and Chemistry, J. A. M. A. **152**:1037-1041 (July 11) 1953.

3. Davidson, H. A.: Contact Test: Method of Measuring Spermicidal Action, Lancet **2**:432-434 (Aug. 29) 1953.

4. Sander, F. V., aand Cramer, S. D.: Practical Method for Testing Spermicidal Action of Chemical Contraceptives, Human Fertil. **6**:134 (Oct.) 1941.

5. Millman, N.: Critical Study of Methods of Measuring Spermidical Action, Ann. New York Acad. Sc. **54**:806-824 (May) 1952.

CLINICAL EVALUATION OF THE STARCH TOLERANCE TEST

F. Warren Nugent, M.D.
and
William A. Millhon, M.D., Boston

Early diagnosis of chronic benign or malignant disease of the pancreas is a problem that has haunted physicians for many years. In spite of rather startling advances made in other fields, clinical evaluation and a high index of suspicion continue to be the mainstays in the diagnosis of these diseases. Several new laboratory tests or modifications of older tests have been put to trial, the starch tolerance test described by Althausen and Uyeyama[1] being one of these. We have attempted to evaluate this test clinically.

The starch tolerance test is based on the premise that pancreatic amylase is the only significant physiologic enzyme responsible for the breakdown of starch into disaccharides. In this form it is absorbed by the intestinal tract. The original authors found that 87% of all patients with chronic benign and malignant disease of the pancreas showed abnormal results on starch tolerance tests. Kalser and coworkers[2] in evaluating the starch tolerance test found an accuracy of 69% in proved cases of pancreatic disease. With these facts in mind we felt that the test should be evaluated with regard to its relative merit in the diagnosis of pancreatic disease.

Materials and Methods

Sixty-eight patients were studied in the department of gastroenterology at the Lahey Clinic. In all cases pancreatic disease was suspected clinically. Studies included history, physical examination, routine laboratory tests, gastrointestinal x-rays, and such further studies as were deemed necessary for their clinical evaluation.

All patients were given a starch tolerance test by the method of Althausen and Uyeyama, with use of either United States Pharmacopia corn starch or chemical "soluble starch." In all cases the starch was prepared under the supervision of one of us (F. W. N.). This was done because of the known difficulty in preparation and also to encourage rapid ingestion by the patients of this distasteful mixture. Although saccharin and small amounts of lemon juice were used, we were unable to produce a palatable mixture.

The maximal rise in blood sugar level after the oral ingestion of glucose was compared to the rise after oral ingestion of starch and calculated as suggested by the original authors. All results over 100% were considered abnormal, while those under 100% were accepted as being within the normal range.

Results

Of the 68 cases studied, in 50 (cases 1-50) the *final diagnosis was some condition other than pancreatic disease*. These conditions included functional disease of the gastrointestinal tract, infectious hepatitis, duodenal ulcer, gastric ulcer, cholelithiasis, retroperitoneal malignant disease not originating in the pancreas, renal cysts and neoplasms, malabsorption syndrome, segmental jejunitis, and hiatus hernia.

In 46 of these cases, the starch tolerance test gave negative results, and in 4 the results were positive. One patient (see table, case 45) had proved metastatic malignancy in a lymph node; this obstructed the ampulla of Vater and therefore the test results cannot be considered false-positive. The results in the other three cases, however, must be considered false-positive. One patient (case 44) had infectious hepatitis, but exploration for suspected carcinoma of the head of the pancreas revealed a normal pancreas. Three other patients with infectious hepatitis had negative results on starch tolerance tests. In one patient (case 24), the absorption of glucose was early and rapid. Within the first half-hour the blood sugar level rose 119 mg. per 100 cc. after ingestion of glucose, whereas it rose only 29 mg. per 100 cc. in a similar period after ingestion of starch. This probably explains the false-positive test. This patient was seen two years later and showed no clinical evidence of pancreatic disease. The other patient (case 29) had cholelithiasis and results of the test were false-positive.

Twelve patients (cases 57-68) had chronic relapsing pancreatitis, as proved at surgical exploration. The starch tolerance test gave positive results in eight of these cases; in four the results were negative. Thus, in cases of chronic benign disease of the pancreas, the over-all accuracy was 66.6%. The glucose tolerance test showed positive results in seven of these cases (58.3%).

From the Department of Gastroenterology, Lahey Clinic. Dr. Millhon is a Fellow in Gastroenterology.

Six cases of carcinoma of the pancreas are included in the group (cases 51-56). The presence of carcinoma was proved at operation in all these cases. In only one case (case 55) did the starch tolerance test show positive results, while in the other five the results were within normal range. The glucose tolerance test showed positive results in five (83.3%). Two other patients (cases 48 and 49) had the picture of carcinoma of the pancreas clinically and roentgenologically. Lung metastases were present in one and metastases to the supraclavicular lymph nodes in the other. Neither was included among the group of patients with cancer of the pancreas, since the diagnosis was not proved. The starch tolerance test gave negative results in both instances.

Summary of Results in Sixty-Eight Patients Given Starch Tolerance Test

Case, No.	Final Diagnosis	Starch Test, %	Remarks
1	Functional gastrointestinal disease	32	Abdominal pain
2	Functional gastrointestinal disease	2	Abdominal pain
3	Functional gastrointestinal disease	0	Abdominal pain and vomiting
4	Functional gastrointestinal disease	0	Abdominal pain and diarrhea; latent diabetes
5	Functional gastrointestinal disease	37	Healed pyloric ulcer and gallstones; latent diabetes
6	Functional gastrointestinal disease	0	Abdominal pain
7	Functional gastrointestinal disease	73	Abdominal pain
8	Functional gastrointestinal disease	9	Abdominal pain
9	Functional gastrointestinal disease	54	Pain in left side of chest; ? enlargement in head of pancreas on x-ray
10	Functional gastrointestinal disease	3	Abdominal pain
11	Functional gastrointestinal disease	0	Abdominal pain; latent diabetes
12	Functional gastrointestinal disease	0	Abdominal pain
13	Functional gastrointestinal disease	0	Abdominal pain
14	Functional gastrointestinal disease	2	Abdominal pain
15	Functional gastrointestinal disease	0	Abdominal pain
16	Functional gastrointestinal disease	0	Back pain; weight loss
17	Functional gastrointestinal disease	0	Abdominal pain; latent diabetes
18	Functional gastrointestinal disease	27	Abdominal pain
19	Functional gastrointestinal disease	0	Weakness; weight loss
20	Functional gastrointestinal disease	32	Abdominal pain; latent diabetes
21	Functional gastrointestinal disease	60	Abdominal pain; nausea
22	Functional gastrointestinal disease	74	Healed gastric ulcer; abdominal pain; latent diabetes
23	Functional gastrointestinal disease	40	Abdominal pain; latent diabetes
24	Functional gastrointestinal disease	310	Abdominal pain; rapid absorption of glucose
25	Cholelithiasis	1	Abdominal pain
26	Cholelithiasis	69	Weight loss; anorexia
27	Common duct stone	0	Abdominal pain
28	Common duct stone	21	Abdominal pain; latent diabetes
29	Cholelithiasis	138	Abdominal pain; latent diabetes
30	Cholelithiasis	54	Abdominal pain
31	Segmental jejunitis	63	Abdominal pain; segmental jejunitis on x-ray; latent diabetes
32	Intermittent obstruction of small intestine	0	Abdominal pain
33	Hiatus hernia	72	Abdominal pain; latent diabetes
34	Hiatus hernia with regurgitation; esophagitis	52	Regurgitation and vomiting; weight loss
35	Duodenal ulcer	0	Abdominal pain
36	Duodenal ulcer	0	Abdominal pain
37	Duodenal ulcer	0	Right upper quadrant pain
38	Left renal cyst	0	Midabdominal pain
39	Left renal cyst	0	Abdominal pain; abdominal mass on left side; latent diabetes
40	Malabsorption syndrome	60	Diarrhea of 18 months' duration
41	Hepatitis	97	Abdominal pain; jaundice; diabetes mellitus
42	Infectious hepatitis	66	Jaundice; x-ray—question of enlargement of head of pancreas; latent diabetes
43	Gastric ulcer; hepatitis	0	Abdominal pain; diarrhea; latent diabetes
44	Hepatitis	559	Vomiting with weight loss; latent diabetes
45	Metastatic carcinoma of colon	139	Mass involving duodenal area and invading ampulla of Vater; latent diabetes
46	Malignant melanoma	0	Retroperitoneal involvement with metastasis to liver; latent diabetes
47	Adenocarcinoma of bile ducts	11	Abdominal pain
48	Retroperitoneal malignancy with metastasis to lungs	29	Abdominal pain; latent diabetes; mass located in pancreatic area, probably representing pancreatic carcinoma but not proved
49	Metastatic malignancy	0	Abdominal pain; latent diabetes; x-ray evidence of mass in pancreatic area, scalenus node positive for carcinoma
50	Carcinoma of the left kidney	30	Weight loss; anorexia
51	Carcinoma of the pancreas	9	Back pain; weight loss; latent diabetes
52	Carcinoma of the pancreas	36	Abdominal pain; latent diabetes
53	Carcinoma of the pancreas	14	Abdominal pain; weight loss; latent diabetes
54	Carcinoma of the pancreas	0	Abdominal pain
55	Carcinoma of the pancreas	100	Abdominal pain; latent diabetes
56	Carcinoma of the pancreas	0	Right upper quadrant pain; anorexia; diabetes mellitus
57	Chronic relapsing pancreatitis	0	Abdominal pain; weight loss; latent diabetes; pancreatic calcifications
58	Chronic relapsing pancreatitis	91	Abdominal pain; latent diabetes; pancreatic calcifications
59	Chronic relapsing pancreatitis	35	Abdominal pain; vomiting; latent diabetes; pancreatic calcifications
60	Chronic relapsing pancreatitis	226	Abdominal pain
61	Chronic relapsing pancreatitis	0	Abdominal pain; vomiting
62	Chronic relapsing pancreatitis	1,850	Abdominal pain; pancreatic cyst
63	Chronic relapsing pancreatitis	200	Abdominal pain; nausea; vomiting
64	Chronic relapsing pancreatitis	140	Abdominal pain; fever
65	Chronic relapsing pancreatitis	173	Abdominal pain; latent diabetes
66	Chronic relapsing pancreatitis	Inf.	Abdominal pain; latent diabetes
67	Chronic relapsing pancreatitis	105	Abdominal pain; latent diabetes
68	Chronic relapsing pancreatitis	165	Abdominal pain; latent diabetes

In all, 18 of the 68 patients in the series proved to have pancreatic disease. In only nine of these cases did the starch tolerance test show positive results. Thus, the over-all accuracy was only 50%. In three instances the test results were false-positive.

Of the 68 patients, 30 had latent diabetes. This condition was defined in our study by a blood sugar level exceeding 140 mg. per 100 cc. two hours after ingestion of glucose. In 12 (66%) of the 18 proved cases of pancreatic disease, latent diabetes was also present. In the 50 patients who did not have pancreatic disease, 18 (36%) had latent diabetes, including 3 of the 4 patients with infectious hepatitis.

In all patients with pancreatic disease, multiple abdominal roentgenograms were taken; these were carefully studied for evidence of calcification in the pancreatic area. Of the 12 patients with chronic relapsing pancreatitis, calcification was found in three instances. Calcification was not noted in any of the six cases of carcinoma of the pancreas.

Comment

The pancreas has two major physiological functions: the endocrine and the exocrine. The endocrine function can be assessed fairly accurately by the glucose tolerance test, a well-established method. Tests of exocrine function, unfortunately, are not as accurate. These can be roughly divided into two groups: tests of acinar function and tests of ductal cell function. Excretion of bicarbonate and water by the ductal cells is the basis of the secretin test.[3] Acinar function is determined by the enzymatic secretions reaching the blood or small intestine. Amylase and lipase determinations, the gelatin tolerance test,[4] the starch tolerance test, radioactive-labeled protein[5] and radioactive-labeled fat[6] studies all attempt to evaluate this function.

Normal pancreatic exocrine function is, of course, a combination of these actions. Acinar cells must be present to secrete the enzymes and a patent ductal system is necessary to deliver them to the intestine. It is well known that the pancreas has a tremendous reserve capacity and that a large portion of the gland may be destroyed without producing significant abnormality in the over-all pancreatic function.

The starch tolerance test is based on a comparison of the ability to absorb orally administered glucose to the ability to absorb orally administered starch. This, in turn, is based on the theory that pancreatic amylase is the only physiologic substance capable of hydrolyzing starch in significant amounts.

Salivary amylase, gastric hydrochloric acid, hydrolyzing substances secreted by the small intestine, and bacterial fermentation in the intestine are capable of producing degrees of starch hydrolysis. That these factors can influence this test is well attested to by the case of Kalser and co-workers.[2] In this case a patient who had undergone total pancreatectomy showed an elevation of the blood sugar level from 200 mg. per 100 cc. to 422 mg. per 100 cc. after the ingestion of starch.

The transit time of food from stomach to colon (particularly for cases in which segments of the upper gastrointestinal tract have been resected) and malabsorption or unusually rapid absorption of glucose can obviously be modifying factors.

Our results with this test would indeed seem discouraging. In all instances, proved pancreatic disease was strongly suspected preoperatively on the basis of evaluation of the clinical course, glucose tolerance, roentgenographic findings, and other evidence. In no case was the starch tolerance test instrumental in solving the problem.

In one patient (case 57) the duct of Wirsung was completely obstructed by a calculus 3 cm. distal to the ampulla of Vater, yet the starch tolerance test gave negative results. In another patient (case 62), however, with cyst formation and pancreatitis localized to the tail of the pancreas, the starch tolerance test gave strongly positive results in spite of the fact that the proximal two-thirds of the gland was quite normal.

The most disturbing aspect of this study is its failure to provide a means of diagnosing carcinoma of the pancreas. This is one of the most difficult challenges we must face. Despite the fact that in each of our six cases the diagnosis was strongly suspected clinically, only one patient showed positive results on the starch tolerance test.

Certainly all efforts must be directed to the search for means of early diagnosis of pancreatic disease. We do not feel, however, that the starch tolerance test is the answer.

Summary

The starch tolerance test was performed on 68 patients in whom pancreatic disease was suspected. Of the 18 patients with proved disease, 9 (50%) had positive results on the starch tolerance tests. Only one patient with proved carcinoma of the pancreas showed positive results on starch tolerance test, whereas the results were negative in the other five. We do not believe this is a reliable test for the detection of pancreatic disease, on the basis of the studies described in this report.

605 Commonwealth Ave. (15) (Dr. Nugent).

References

1. Althausen, T. L., and Uyeyama, K.: New Test of Pancreatic Function Based on Starch Tolerance. Ann. Int. Med. **41:**563-575 (Sept.) 1954.

2. Kalser, M. H.; Lopusniak, M. S.; and Bockus, H. L.: Comparison of the glucose tolerance, starch tolerance, secretin, and fecal balance studies in pancreatic disease, Memoria V Congreso Panamericano de Gastroenterologia **2:**935-946, 1956.

3. Dreiling, D. A., and Janowitz, H. D.: Exocrine Pancreatic Secretion: Effects of Pancreatic Disease, Am. J. Med. **21:**98-116 (July) 1956.

4. West, C. D.; Wilson, J. L.; and Eyles, R.: Blood Amino Nitrogen Levels; Changes in Blood Amino Nitrogen Levels Following Ingestion of Proteins and of Protein Hydrolysate in Infants with Normal and with Deficient Pancreatic Function, Am. J. Dis. Child. **72:**251-273 (Sept.) 1946.

5. Chinn, A. B.; Lavik, P. S.; Stitt, R. M.; and Buckaloo, G. W.: Use of I^{131} Labeled Protein in Diagnosis of Pancreatic Insufficiency, New England J. Med. **247:**877-880 (Dec. 14) 1952.

6. Shingleton, W. W., and others: Evaluation of Pancreatic Function by Use of I^{131} Labeled Fat, Gastroenterology **32:**28-32 (Jan.) 1957.

CORNEAL COMPLICATION OF CHLOROQUINE (ARALEN) PHOSPHATE THERAPY

Robert W. Zeller, M.D.
and
Donald Deering, M.D., Portland, Ore.

Alteration of the corneal epithelium causing blurred vision occurred in 10 patients taking chloroquine (Aralen) phosphate, which is currently being used for a variety of diseases including malaria, lupus erythematosus, arthritis, and infestation with intestinal parasites. Chloroquine has a low incidence of toxicity. However, the corneal changes resulting in some patients taking the drug lead to symptoms (haloes around lights and blurred vision) suggestive of glaucoma. The change in the corneal epithelium varied from diffuse discrete white depositions to yellowish discrete dots grouped at the level of the epithelium and Bowman's membrane. The configuration of the depositions was diffuse in some cases, but most were linear. The maximal involvement was usually in the central portion of the cornea, with the area just below the pupil showing the greatest concentration.

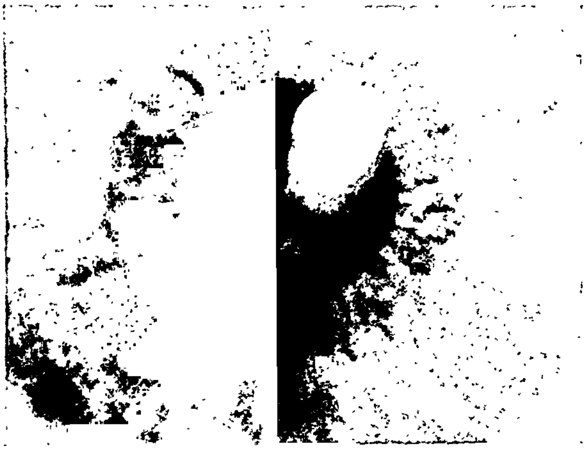
Some of the patients did not have any complaints about their vision. However, four sought ophthalmological help because they saw haloes around lights at night. All four had been told nothing was wrong and it had been intimated that they were suffering from "nerves." This diagnosis was made because the change is a slight one and careful examination with the biomicroscope (slit-lamp) is necessary to see the alteration in the cornea. When the disease is further advanced it is quite easy to see the pigment deposits. Reduction of visual acuity was not seen even though patients complained of blurring of their vision. When these patients were tested with Snellen charts their visual acuity was not lower than it had been prior to drug therapy. In some cases the granular appearing deposits became quite dense and assumed a more or less yellowish appearance. The density of the opacification of the cornea does not seem to be definitely related to the amount of drug taken. A patient taking 1,000 mg. of chloroquine daily for three years showed less change than one taking 250 mg. daily for nine months (see figure).

Twenty-two patients exhibiting the same corneal changes were described by Hobbs and Calnan.[1] In most of their cases, the corneal abnormalities regressed when the drug therapy was stopped. Our cases showed the same happy results occurring two to four months after therapy was stopped. However, Hobbs and Calnan reported one case in which visual acuity continued to decrease even after therapy was stopped.

Corneal changes of a different nature (edema of the corneal epithelium) have been reported in patients taking quinacrine (Atabrine) hydrochloride which is chemically related to chloroquine.[2] No edema was seen in our patients or was reported by Hobbs and Calnan.

Yellow staining of the conjunctiva and cornea occurred in workers in contact with quinacrine dust in a factory where the drug was manufactured. The staining was interpreted as actually representing the drug itself.[3] No conjunctival involvement was seen in our patients and the blue haloes seen by quinacrine workers are different from the blurred vision and haloes noted by patients taking chloroquine.

There is evidence chloroquine is widely stored in the structures of the body. In two of our most severely involved cases the patients appeared to have a faint fluorescence of the involved cornea when exposed to the Wood's light (ultraviolet). This possibly indicates that it is the drug itself which is deposited in the corneal epithelium because the drug does fluoresce. In less involved cases there is no fluorescence. It is too early to state whether or not chloroquine is stored in the lens epithelium, but this seems a definite possibility.



Linear and diffuse pigment deposits in central corneal epithelium of 48-year-old woman treated with chloroquine for arthritis (250 mg. daily for nine months).

Summary

Ten patients exhibiting discrete opacification of the corneal epithelium were taking chloroquine (Aralen) phosphate for arthritis or lupus erythematosus. The changes appear to be reversible on cessation of the drug therapy. Not all patients complained of visual problems but all showed corneal abnormalities with the biomicroscope. Some noted haloes around lights, a symptom which may lead to a mistaken diagnosis of glaucoma.

3181 S. W. Sam Jackson Park Rd. (1) (Dr. Zeller).

From the Department of Ophthalmology, University of Oregon Medical School.

References

1. Hobbs, H. E., and Calnan, C. D.: Ocular Complications of Chloroquine Therapy, Lancet **1**:1207-1209 (June 7) 1958.

2. Chamberlain, W. P., Jr., and Boles, D. J.: Edema of Cornea Precipitated by Quinacrine (Atabrine), Arch. Ophth. **35**:120-134 (Feb.) 1946. Reese, F. M.: Edema of Corneal Epithelium Caused by Atabrine: Observation on 3 Patients, Bull. Johns Hopkins Hosp. **78**:325-332 (July) 1946.

3. Mann, I.: "Blue Haloes" in Atabrine Workers, Brit. J. Ophth. **31**:40-46 (Jan.) 1947.

PURPURA DUE TO CHLOROTHIAZIDE (DIURIL)

Manuel O. Jaffe, M.D.
and
Robert R. Kierland, M.D., Rochester, Minn.

Chlorothiazide (Diuril) is an orally administered, nonmercurial, diuretic agent. Chemically, it is known as 6-chloro-7-sulfamyl-1,2,4-benzothiadiazine-1,1-dioxide.[1] It was made available commercially only this year; but, in its use thus far reported, the absence of toxic and otherwise undesirable side-effects has been especially noted.[2]

Ten of 51 patients observed by Hollander and Wilkins [2a] experienced slight to moderate weakness and fatigability, which usually disappeared with continuous treatment. In several, this weakness was associated with a feeling of mental depression, and, in a few of these, the level of serum potassium was reduced. Five patients complained of temporary mild nausea, especially when given 500 mg. of chlorothiazide in single doses. Other uncommon side-reactions included muscle cramps, flushing, lightheadedness, and paresthesias.

The potential development of clinical symptoms and signs of fluid and electrolyte imbalance resulting from chlorothiazide therapy has been stressed by all investigators.[2]

So far as we know, purpura resulting from the administration of chlorothiazide has not been reported in the literature. Two patients with such effects have been seen recently at the Mayo Clinic, and their cases are described here.

Report of Cases

Case 1.—A 66-year-old man was seen because of an eruption of two weeks' duration on his legs. The patient said he had taken chlorothiazide for one month several months before being seen at the clinic but had stopped for no definite reason. Two weeks before the present examination, he began again to take the drug, 500 mg. twice a day. Within two days after resuming chlorothiazide therapy, he noted the appearance of a petechial eruption about both ankles with subsequent involvement of the dorsa of the feet and hands and the distal half of both lower legs. The patient had continued to take chlorothiazide up to the time he was seen at the clinic. He denied bleeding from any of the body orifices or the gums. Four years previously he had given a history of easy bruising and prolonged bleeding, though examination at that time was nonrevealing. He denied the use of other drugs.

The patient was admitted to the hospital. The pertinent dermatological findings consisted of a confluent, symmetrical purpura involving the ankles and lower half of both legs. There were scattered petechiae involving the dorsa of the feet and hands. The patient also had keratoderma of the palms and soles and intertrigo of the inguinal areas. Hematological examination, including tests of the bleeding and clotting mechanisms, gave results within the limits of normal.

The patient was treated with bed rest and diphenhydramine (Benadryl) hydrochloride. The use of chlorothiazide was discontinued. During 10 days of hospitalization, 85% of the purpura cleared with no new lesions appearing during that time.

Case 2.—A 70-year-old man with congestive heart disease had been a patient at the clinic for many years. He had been receiving mercaptomerin (Thiomerin) sodium for three years and digitoxin preparations and ammonium chloride for two years. In January, 1958, he had been instructed to take chlorothiazide, 500 mg. twice daily three times a week.

In June, 1958, the patient showed dermatosis on his hands. Examination at this time revealed petechiae and purpura symmetrically distributed on the dorsa of the hands and about the ankles. Hematological examination, including tests related to the bleeding and clotting mechanisms, gave results within normal limits except for a count of only 94,000 platelets per cubic millimeter of blood. Continued use of digitoxin and ammonium chloride was advised, but chlorothiazide and mercaptomerin were no longer prescribed.

During the next week the amount of purpura and number of petechiae increased, with spread of the lesions to involve the lower half of the legs and the forearms. The patient's condition merited the use of mercaptomerin, and this was given without obvious increase in the severity of the purpura.

During the next two weeks, there was complete resolution of the petechiae and purpura. Throughout this time, digitoxin, ammonium chloride, and mercaptomerin were administered without apparent toxic effect. Their use has been continued to the time of writing without recurrence of purpura. Reappearance of purpura followed promptly, however, after chlorothiazide was given again in a single dose of 500 mg.

Summary

Previously reported undesirable side-effects of chlorothiazide (Diuril) therapy have been primarily those related to fluid and electrolyte imbalance.

From the Section of Dermatology, Mayo Clinic and Mayo Foundation. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

At this clinic, two cases of purpura resulted from the administration of this drug.

200 First St. S. W. (Dr. Jaffe).

References

1. Schreiner, G. E., and Bloomer, H. A.: Effect of Chlorothiazide on Edema of Cirrhosis, Nephrosis, Congestive Heart Failure and Chronic Renal Insufficiency, New England J. Med. **257**:1016-1022 (Nov. 21) 1957.

2. (*a*) Hollander, W., and Wilkins, R. W.: Chlorothiazide: New Type of Drug for Treatment of Arterial Hypertension, Boston M. Quart. **8**:69-74 (Sept.) 1957. (*b*) Moyer, J. H.; Ford, R. V.; and Spurr, C. L.: Pharmacodynamics of Chlorothiazide (Diuril), Orally Effective Non-mercurial Diuretic Agent, Proc. Soc. Exper. Biol. & Med. **95**:529-531 (July) 1957. (*c*) Freis, E. D., and Wilson, I. M.: Potentiating Effect of Chlorothiazide (Diuril) in Combination with Antihypertensive Agents: Preliminary Report, M. Ann. District of Columbia **26**:468; 516 (Sept.) 1957. (*d*) Reference 1.

COUNCIL ON FOODS AND NUTRITION

METABOLIC AND BIOCHEMICAL CHANGES IN NORMAL PREGNANCY

Icie G. Macy, Ph.D., Sc.D., Detroit

The following is one of the six papers presented at the symposium on "Nutrition in Pregnancy" in Columbia, Mo., Oct. 11, 1957. This symposium was sponsored by the Council on Foods and Nutrition with the cooperation of the Boone County Medical Society, the University of Missouri School of Medicine, and the Adult Education and Extension Service of the University of Missouri.

Philip L. White, Sc.D., *Secretary.*

Many inherent metabolic and biochemical changes occur at the time of and after conception. Gestation presents three recognizable phases: (1) the preimplantation period that extends for approximately two weeks after conception; (2) the two-to-eight-week interval during which major organogenesis takes place; and (3) the period of most rapid prenatal and maternal growth, which extends from about eight weeks to term.

Metabolic and Functional Changes in Pregnancy

The implantation of the fertilized ovum causes the regulatory and functional mechanisms of the body to be thrown out of balance and results in a disturbed physiological state. The effects are observed in upsets in the gastrointestinal system—a decrease in appetite resulting in reduced food consumption, and nausea, sometimes with vomiting, which may result in a loss in weight. The results of metabolic changes may be seen in the level or distribution of blood components, in the level of urinary components, in the retention of nutrients, in the composition and function of the blood cells, in hormonal secretions, and in the composition and function of the placenta.

Alterations in Hormonal Secretions.—The three hormones primarily concerned in reproduction are the gonadotropins, the estrogens, and progesterone.[1]

Gonadotropins can be detected in the serum and in the urine a few days after the first missed menstrual period and continue to increase rapidly, reaching the maximum in about 50 to 70 days. They are believed to work in conjunction with the corpus luteum, causing it to persist and play a dominant role in organogenesis and growth of the fetus until about the fourth month of pregnancy. At the height of production, the gonadotropins may be excreted at a rate of 40,000 to 200,000 rat units per 24 hours. This level of excretion is maintained for a short time; by the 110th to the 120th day, it decreases to 5,000 to 10,000 rat units per 24 hours, a level maintained until the end of pregnancy. In cases of disturbed gestation, a late rise in both serum and urinary gonadotropins may occur. Biological tests of pregnancy depend on the presence of gonadotropins.

Progesterone, the corpus luteum hormone, is secreted until the third or fourth month of pregnancy. It stimulates the occurrence of secretory changes in the endometrium in preparation for the implantation of the fertilized ovum about the sixth day of the luteal phase of the ovum. By the third week of gestation, the placenta has grown and has developed to the point of initial functioning, producing some progesterone. Increased growth and function of the young metabolically active placenta permit it to take over the formation of progesterone between the second and third months of gestation, thus continuing the conditioning of the endome-

---

From the Merrill-Palmer School.

trium to provide for the nourishment of the conceptus. The reduction of progesterone is measured by its metabolites, pregnanediol and pregnanolone, and it is excreted as glycuronides of these substances. Maximum secretion is usually reached around the 220th to the 240th day. At term, values of the pregnanediol complex may fall between 50 and 100 mg. per 24 hours. After delivery, this hormone disappears rapidly from the urine.

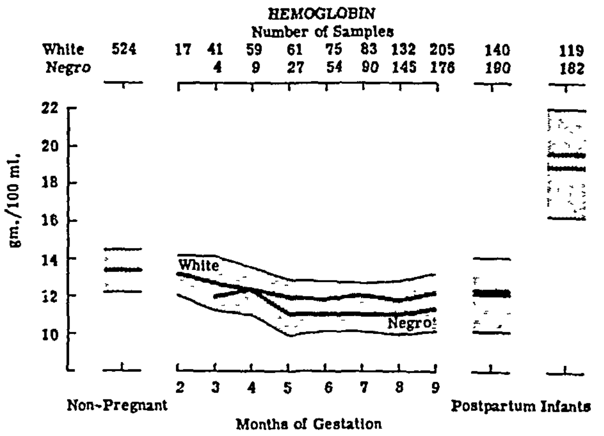


Fig. 1.—Trend of median hemoglobin levels of white, nonpregnant women, of selected white and Negro women during gestation and after delivery, and of their respective newborn, term infants. The 10th-90th percentile range for combined racial groups serves as standard for normality.

The pattern of estrogen level is similar to that of pregnanediol, low in early pregnancy with a slow increase through gestation. It does not increase appreciably until about the 100th day, with the greatest increase occurring in the last half of pregnancy, reaching values of 40,000 to 50,000 mcg. per 24 hours and attaining its maximum about 10 days before delivery. Estrogen and progesterone are maintained at high blood concentration levels during pregnancy; they stimulate growth and functional changes in the breasts and suppress the lactogenic function of the pituitary gland until delivery, when the pituitary gland stimulates the mammary glands to secrete milk.

The alteration in steroid metabolites during normal pregnancy has provided a valuable index of the adaptation of the adult organism to pregnancy.[1] The ketosteroid components in the urine of pregnant women differ quantitatively and qualitatively from those found in the urine of nonpregnant women. Of the 19 ketosteroids that have been characterized, 11 have been found in the urine of pregnant women. These observations furnish evidence that pregnancy induces alterations in the mechanisms of production or metabolism of the steroid precursors.

Placental Development.—During pregnancy, the growth rate of the placenta does not parallel that of the fetus, since the former attains its maximum size early in gestation. In the seventh month of pregnancy, the ratio of fetal weight to placenta weight is about 3.7:1; at term it has increased to 7.5:1. The wet weight of placentas ranges from 325 to 1,000 Gm., with an average of about 580 Gm. Large birth weights are not indicative of large placentas.

The placenta is essentially an organ with a nutritional function; it is well supplied with carbohydrate, protein, fat, enzymes, hormones, and minerals. Though there is a dearth of information about the progressive changes in the chemical composition of the placenta, under normal conditions its chemical composition during gestation varies to suit the demands made on it by the growing fetus. For example, the fat and carbohydrate contents are reduced in the last quarter of pregnancy; the vitamin content of the placenta increases during the course of pregnancy and then decreases near its termination.

Fetal nutrition depends, to a large extent, on the efficiency of the transmission of material across the placental barrier. The area of contact between maternal and fetal circulations has been estimated as between 10 and 13 sq. m. Only materials that can be carried in solution by the blood and can pass through the semipermeable wall of the chorionic villi can penetrate this barrier. Proteins of large molecular structure, with the exception of antibodies, are not transferred, whereas amino acids and proteoses are. Fetal fat is synthesized from lipid components passed from the mother's blood to that of the fetus. Chemically it is quite different from the body fat of the mother; fetal fat is richer in palmitic acid and contains less oleic and stearic acids. Vitamin D, ascorbic acid, thiamine, and

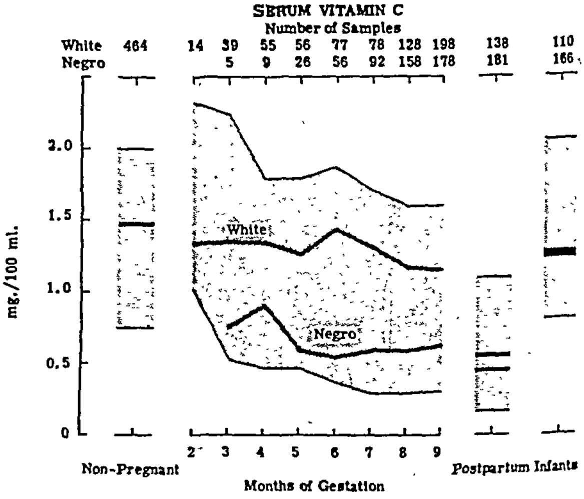


Fig. 2.—Trend of median serum vitamin C levels of white nonpregnant women, of selected white and Negro women during gestation and after delivery, and of their respective newborn, term infants. The 10th-90th percentile range for combined racial groups serves as standard for normality.

riboflavin are present in the human placenta [2] and are passed through it in regulated amounts. Vitamin A and carotene are passed through the placenta in less regulated amounts.

The placenta may well be considered an endocrine gland, since hormones similar to those of the pituitary gland have been demonstrated and since endocrine functions of the ovary are duplicated. Needham [3] pointed out the high content of ascorbic acid in the corpus luteum and the fact that it paralleled progesterone; he then assumed that ascorbic acid may be necessary to the production of the hormone. Values for ascorbic acid in the corpora lutea of nonpregnant women range from 24.8 to 48.3 mg. per 100 Gm.; for women in the second to fifth month of pregnancy, the values are 42.3 to 148.7 mg. per 100 Gm. The ascorbic acid content of the placenta is greater in the early months of pregnancy when its metabolic activity is greatest. The ascorbic acid content of an infant at birth averages 38 mg. per 100 Gm. of tissue; it decreases to 10.8 mg. per 100 Gm. during the first four months after birth. Excretion of ascorbic acid in the urine of the newborn infant [4] would indicate that there must be a plethora of this vitamin for fetal growth and development.

At the fourth month of development, the fats and lipids of the placenta are present in greater quantity in relation to the weight of the fetus than at any other time. In the developing placenta, there is disintegration of the lipids, releasing fatty acids, phosphorus, and choline. In comparison with values of other tissues, niacin is the only one of the B vitamins that is present in relatively large amounts.

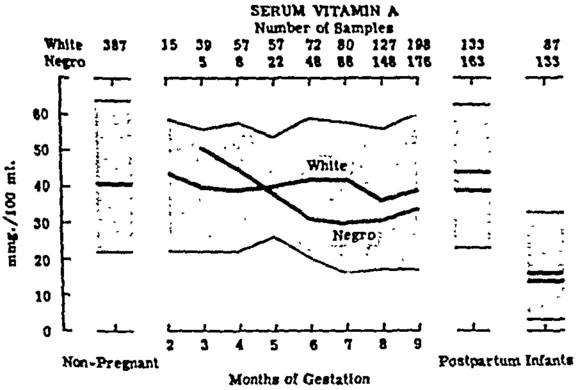


Fig. 3.—Trend of median serum vitamin A levels of white nonpregnant women, of selected white and Negro women during gestation and after delivery, and of their respective newborn, term infants. The 10th-90th percentile range for combined racial groups serves as standard for normality.

Basal Metabolism.—The basal metabolic rate falls from a normal to a subnormal level during the third to the fourth month of gestation. From this point, a steady increase is noted that amounts to 13% or more in excess of the rate conditioned by the gross increase in body weight. The basal metabolic rate does not differentiate between the tissues with high metabolic activity, such as the placenta, the fetus, and organs of both mother and fetus, that are more active than others. Basal metabolism is also influenced by increased thyroid function, as demonstrated by the steady increase of blood iodine from the second to the tenth month and by a decrease in blood iodine in the first two weeks of puerperium. Anatomic studies of thyroid glands obtained at autopsy from pregnant women [5] reveal larger follicles with abundant colloid and, at the same time, definite signs of cellular hypertrophy when compared with thyroids from nonpregnant women. Experimental studies suggest a greater need for thyroid hormone during pregnancy.

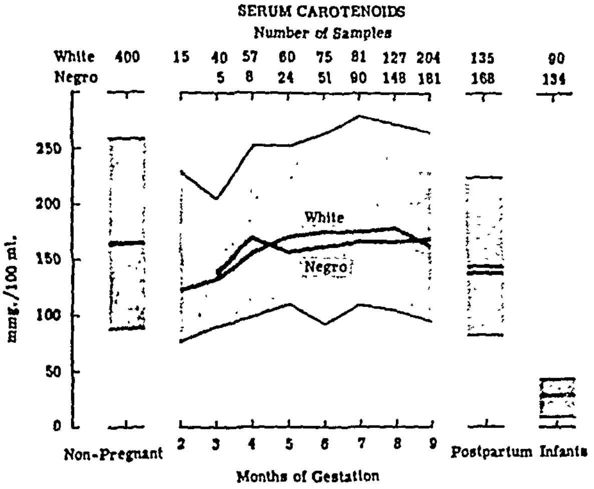


Fig. 4.—Trend of median serum carotenoid levels of white nonpregnant women, of selected white and Negro women during gestation and after delivery, and of their respective newborn, term infants. The 10th-90th percentile range for combined racial groups serves as standard for normality.

Other Hormonal Implications.—Loss of appetite, reduction in food intake, and disturbed gastrointestinal equilibrium in the preimplantation and organogenesis phases of pregnancy may well result from the excessive amounts of certain hormones elaborated by these glands [6] and from the morphologic and functional changes which they bring about in the digestive tract. The efficiency of absorption and of enzyme production is dependent on hormonal support. Recent studies show how the growth hormone produced during pregnancy increases nitrogen retention in the tissues in the form of protein.[7] It aids nitrogen conservation whenever dietary protein and carbohydrate are in short supply. This hormone or its companions influence fatty acid and ketone body metabolism.[8] Pregnancy increases vitamin B_{12} absorption.[9] Parathyroid hormones have been shown to act as biological regulators of calcium metabolism.

Blood Volume Increases.—There is an increase in plasma volume during pregnancy that averages approximately 25% at term over the nonpregnant value. A sharp increase occurs through the second trimester and during the first half of the third trimester, after which the plasma volume tends to remain constant or to decrease. In evaluating results of blood studies during pregnancy, a major physiological influence is known to be the change in blood volume.[10]

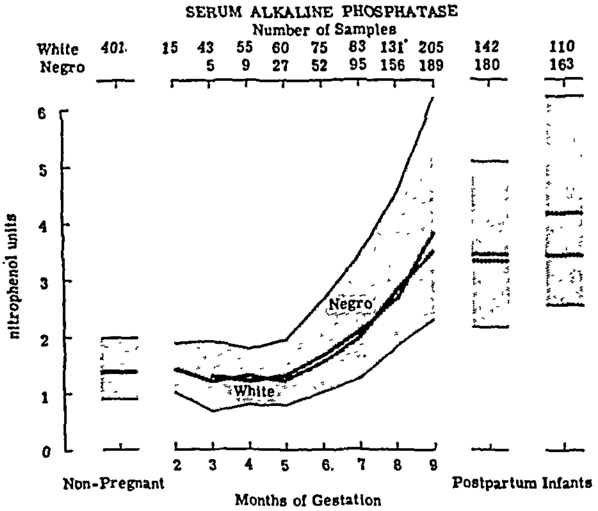


Fig. 5.—Trend of median serum alkaline phosphatase levels of white nonpregnant women, of selected white and Negro women during gestation and after delivery, and of their respective newborn, term infants. The 10th-90th percentile range for combined racial groups serves as standard for normality.

Biochemical Changes

During pregnancy many biological changes occur. The liver, kidneys, adrenals, and other vital organs develop functional activity commensurate with the stage and demand of gestation. Single determinations contribute little to the evaluation of biochemical individuality and customary responses; however, successive determinations performed as metabolic and physiological functional changes are taking place show individual patterns and deviation from established patterns.

Blood Determinations.—Any interpretation of physiological trends during gravidity, however, must recognize alterations in blood volume, since blood volume increases. If there are no changes in the concentration of the blood constituents with pregnancy, it is obvious that there are increased amounts in the bodies of mother and fetus. An increase in concentration indicates an even greater increase in the supply available.

Until methods for determining blood volume become easier to administer to groups of individuals, we have assumed that, if differences in gestational weight changes are not appreciable among healthy female subjects, the blood volume changes are similarly not significant. This assumption is necessary for comparisons of the concentrations of several blood components from the various groups at equivalent stages of gestation. In our studies, the characterization of the various groups suggests that, in the interpretation of the data on the basis of nutritional status, investigations of racial characteristics, of inequality of nutrient intake, and of prenatal care should also be undertaken.

We have presented observations[11] made on selected subjects who successfully completed gestation and delivery without any unusual disturbance or disease and who were delivered of healthy, full-term infants weighing at least 2,500 Gm. (5.5 lb.). Criteria for selection included consideration of medical history, clinical course during pregnancy, and outcome of gestation, with respect to both mother and child. Excluded from the group were women with physical structural defects, congenital or acquired, and those in whom malnutriture or disease had left recognizable clinical effects so serious that their health might have been permanently impaired. If either mother or infant were to be omitted for any of these reasons, both were excluded. Such conditions as syphilis and toxemia during current pregnancy were bases for categorical exclusion from the selected group. In some instances, obstetric judgment combined with pediatric consultations in relation to the condition of the infant were determining factors. Women whose deliveries involved operative procedures were excluded as well as those who were in labor over 24 hours. The blood values for 48 nonpregnant white women provided a basis for observing the physiological alteration from the nonpregnant to the pregnant state; those values for the selected group of 425 patients, chosen because they were free from clinical manifestation of disease, provided average and range values that may be used as standards for departures from health.

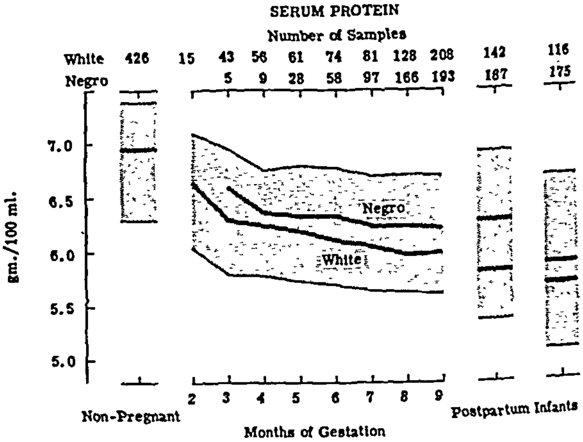


Fig. 6.—Trend of median serum protein levels of white nonpregnant women, of selected white and Negro women during gestation and after delivery, and of their respective newborn, term infants. The 10th-90th percentile range for combined racial groups serves as standard for normality.

In obtaining data for blood composition, unaccountably high or low results may occur which may not be true values. Such figures were eliminated by including values in the 10th to 90th percentiles, which characterize the usual physiological course during pregnancy. The medians and the 10th to 90th percentile ranges for hemoglobin, serums total protein, vitamin A, carotenoids, vitamin C, and alkaline phosphatase are presented. Data are also given for nonpregnant women, for the selected white and Negro women during pregnancy and for one to eight days post partum, and for their full-term infants one to nine days after birth.

Hemoglobin.—The medians and ranges for hemoglobin throughout pregnancy were lower than those of the nonpregnant women (fig. 1). The range of levels for white women was higher than the range for Negro women, indicating a difference in the racial groups. The median hemoglobin values for women of the white race were 0.7 to 1 Gm. higher than those for women of the Negro race during the last months of pregnancy. Selected white infants displayed hemoglobin levels higher by as much as 1 Gm., and the median levels were approximately 50% greater than the values of their respective mothers.

The extent to which hemoglobin will be formed depends, in large measure, on the availability in the body of iron and organic components for porphyrin formation and of essential amino acids for globulin formation. The number of organs and components in the body and the food components that converge to help perfect the synthesis, the metabolism, the distribution, and the destruction of hemoglobin are legion. The mechanisms that control the distribution of essential amino acids are little understood. Normally, the fetus acquires a reserve store of iron from the maternal organism via the placenta, especially during the last trimester of pregnancy. The placenta appears to conserve hemoglobin for fetal construction and reserves at the expense of the mother. An overstrain on the function of hematogenesis is shown by the mild secondary anemia, common in pregnancy. The physiological anemia (normocytic) of pregnancy is due to dilution by blood volume increase and causes no radical change in the alteration of the blood picture, since the reduction in hemoglobin, erythrocytes, and hematocrit is in direct proportion. To what extent particular hormonal factors in pregnancy alter the rate of the blood-building process and the development of an anemic state in pregnancy is being investigated.[12]

Serum Ascorbic Acid.—The serum of nonpregnant white women had higher concentrations of ascorbic acid than that of the selected white women in the first trimester of pregnancy (fig. 2). A downward trend throughout pregnancy extended into the postpartum period, but throughout gestation the levels of the white women were much higher than those of the Negro women. The ascorbic acid levels of the Negro women, though much lower earlier in pregnancy, did not show as much decline before delivery. The ascorbic acid concentrations in infant blood were almost alike for the two races, but the range was higher for white infants.

A shortage of ascorbic acid in the diet during pregnancy may thwart the growth impulses of the mother and her offspring in utero by impairing physiological function. Average serum concentrations of this vitamin for infants are two to four times that of the mothers' serum. This fact gives credence to the theory that the placenta exerts selective control over the passage of ascorbic acid and may act as a barrier to re-entrance of the vitamin into the maternal circulation.

Without doubt, endocrine changes exert some influence on maternal blood levels of ascorbic acid, just as the ascorbic acid content of the adrenal gland is high in pregnancy. Ascorbic acid and proteins are involved in the metabolic mechanism of the adaptation syndrome occurring during the stress of physiological disturbances in pregnancy. It is generally recognized that fetal needs take priority over maternal needs for this vitamin and that the fetus may build up a substantial reserve of it at the expense of the mother.

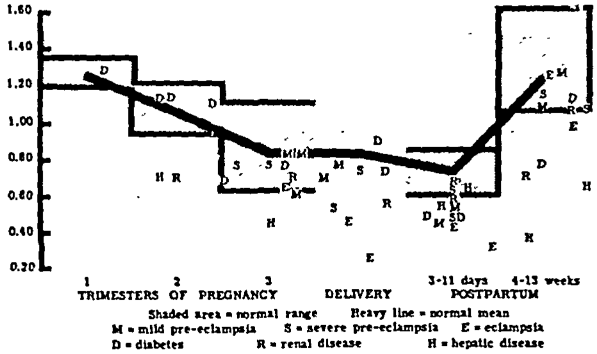


Fig. 7.—Albumin:globulin ratio in maternal blood during and after pregnancy.

Serum Vitamin A.—The median concentrations of serum vitamin A of nonpregnant white women and selected white patients in the first trimester were not different (fig. 3). The median values were consistently higher for white than for Negro women during the last five months of gestation and post partum. Although the difference between the medians for white and Negro infants was small, that of the Negro was lower. Vitamin A and its precursors, the carotenoids, have special roles in the formation of the epithelial cells during organogenesis, in the maintenance of their integrity, and in the formation of bone.[13]

Serum Carotenoids.—The median serum carotenoid level for nonpregnant white women was higher than that for the selected white subjects in the first trimester (fig. 4). For both white and Negro subjects, however, upward trends in early pregnancy were followed by leveling off after the sixth month and lowered values post partum. The levels for white and Negro infants were not different but were much lower than those of their mothers.

Serum Alkaline Phosphatase.—The pattern for serum alkaline phosphatase is different from those for hemoglobin and the vitamins, because its concentration in serum more directly parallels skeletal growth and maturation in the fetus and mineral storage in the maternal organism. The trend was definitely upward through the ninth month, with the levels decreasing in the puerperium (fig. 5).

Alkaline phosphatase enzymes are widely distributed in the organs and tissues of the body, occurring in high concentration in bone and ossifying cartilage. Their activity is related to calcium homeostasis [14] and vitamin D nutriture. Data demonstrate that physiological changes in alkaline phosphatase concentration occur with regularity during the reproductive cycle, the magnitude of change corresponding in large measure to anatomic growth and development.

*Proteins in Blood Plasma of Mothers During Pregnancy, at Delivery, and Post Partum**

Determinations	Trimester of Pregnancy†			Delivery	Post Partum		
	1 3	2 7	3 15‡	16	12-24 Hr. 3	5-6 Days 9	6-12 Weeks 13
Albumin							
Mean	4.22	3.89	3.43	3.41	2.68	3.15	4.07
Range	3.79-4.62	3.27-4.41	2.43-4.07	2.51-4.60	2.45-2.91	2.78-3.58	3.40-4.71
Alpha$_1$ globulin							
Mean	0.40	0.44	0.51	0.48	0.54	0.69	0.42
Range	0.32-0.45	0.34-0.53	0.32-0.72	0.40-0.66	0.43-0.66	0.59-0.77	0.33-0.51
Alpha$_2$ globulin							
Mean	0.70	0.77	0.87	0.94	0.86	1.10	0.66
Range	0.67-0.76	0.65-1.00	0.66-1.15	0.46-1.32	0.58-1.10	0.71-1.29	0.59-0.89
Beta globulin							
Mean	0.96	1.20	1.36	1.40	1.22	1.38	1.05
Range	0.90-1.04	0.92-1.48	0.94-1.95	1.11-1.93	1.17-1.29	1.17-1.57	0.83-1.29
Phi globulin							
Mean	0.55	0.58	0.65	0.70	0.67	0.69	0.43
Range	0.51-0.57	0.49-0.73	0.50-0.92	0.45-1.07	0.61-0.76	0.54-0.90	0.28-0.65
Gamma globulin							
Mean	0.73	0.69	0.68	0.62	0.50	0.54	0.78
Range	0.64-0.87	0.56-0.83	0.46-0.90	0.32-0.87	0.44-0.56	0.27-0.64	0.27-1.15
Total protein							
Mean	7.56	7.57	7.50	7.55	6.47	7.55	7.41
Range	6.88-8.06	6.57-8.70	5.96-8.68	5.86-10.26	5.93-7.23	6.67-8.48	6.26-8.20

* Values in Gm./100 cc. of plasma.

† According to estimated date of confinement, determinations in first trimester were made in 4th to 9th week of pregnancy; those in second trimester were made between 15 and 25 weeks of gestation; those in third trimester were made after 28 to 41 weeks of pregnancy.

‡ Fourteen subjects. In all other groups, number of determinations also is number of subjects.

Blood Proteins.—Levels of total serum protein of nonpregnant white women were higher than medians for white and Negro women at any time during gestation (fig. 6). For women of both races, the trend of serum protein concentrations was downward throughout pregnancy, the median differences ranging from 0.11 to 0.46 Gm. per 100 ml. of serum. The protein levels of infants were lower than those of their respective mothers, and both the median and the range for the Negroes exceeded those of the white race.

The intensity with which the maternal body builds active body tissue, the rapidity with which labile protein and mineral reserves are accumulated, and the extent of alterations taking place in hormonal excretions may influence the level of serum protein. Physiologically, total serum protein has less significance than the quantities and properties of the several component proteins, each one differing in composition and performing widely different physiological functions in the body.

Observations of levels of total serum protein, albumin, and alpha$_1$, alpha$_2$, beta, phi, and gamma globulins during pregnancy and subsequent to delivery demonstrated a characteristic pattern of distribution of these components for uncomplicated pregnancy; the pattern is disturbed in complicated pregnancy,[15] however, and some diseases present distinctive patterns (fig. 7).

Electrophoretic analysis of the proteins in plasma or serum provides a more detailed and reliable picture of this labile biological system than do other methods, although values are frequently lower than those obtained by chemical methods. Data for women during and after both uncomplicated and complicated pregnancies demonstrated the variations attributable to individual physiological differences among women, as well as differences in the time of the cycle during which the blood samples were drawn. In general, trends for albumin and gamma globulin were downward; trends for alpha$_1$, alpha$_2$, beta, and phi (fibrinogen) globulins were upward until delivery or at term; subsequently, the trends were reversed and the values approached those of the nonpregnant state. The plasma albumin: globulin ratios for each period in the reproductive cycle showed the decreases consequent to lowered albumin concentration and higher globulin concentration during pregnancy, with the return post partum toward the nonpregnant relationship. During the first trimester (preimplantation and organogenesis phases), the decreases in albumin gamma globulin were obvious; in the second and third trimesters (growth phase), the concentrations of albumin and gamma globulin in total protein were reduced significantly.

Summary

Pregnancy causes the regulatory and functional mechanisms of the body to be thrown out of balance. The effects of these imbalances are frequently seen as upsets in the gastrointestinal system. Results of the metabolic changes are observed in the composition of the blood cells and in the differing levels and distribution of the blood components. The levels of urinary components, the changes in hormonal secretions, the greater retention of nutrients, and the composition and function of the placenta are all indications of the metabolic changes that take place at the time of or after conception.

Figures 1 through 6 are reproduced with permission from Macy and others.[11]

The table and figure 7 are reproduced with permission from Macy and Mack.[16]

References

1. Normal and Pathological Physiology of Pregnancy, Proceedings of the Conference of the Committee on Human Reproduction of the National Research Council, Obst. & Gynec. Surv. **3:**1-176 (Oct.) 1948.

2. Pratt, J. P.; Roderuck, C.; Coryell, M. N.; and Macy, I. G.: Composition of Human Placenta: III. Vitamin Content, Am. J. Obst. & Gynec. **52:**783-787 (Nov.) 1946.

3. Needham, J.: Biochemistry and Morphogenesis, London, Cambridge University Press, 1942.

4. Hamil, B. M., and others: Vitamin C in Blood and Urine of Newborn and in Cord and Maternal Blood, Am. J. Dis. Child. **74:**417-433 (Oct.) 1947.

5. Stoffer, R.; Koeneck, I. A.; Chesky, V. E.; and Hellwig, C. A.: Thyroid in Pregnancy, Am. J. Obst. & Gynec. **74:**300-308 (Aug.) 1957.

6. Baker, B. L.: Influence of Hypophysis and Adrenal on Digestive Function, Am. J. Clin. Nutrition **5:**445-452 (July-Aug.) 1957.

7. Russel, J. A.: Effect of Growth Hormone on Protein and Carbohydrate Metabolism, Am. J. Clin. Nutrition **5:**404-416 (July-Aug.) 1957.

8. Engel, F. L.: Influence of Endocrine Glands on Fatty Acid and Ketone Body Metabolism, Am. J. Clin. Nutrition **5:**417-430 (July-Aug.) 1957.

9. Hellegers, A., and others: Vitamin B_{12} Absorption in Pregnancy and in Newborn, Am. J. Clin. Nutrition **5:**327-331 (May-June) 1957.

10. Caton, W. L.; Roby, C. C.; Reid, D. E.; and Gibson, J. G.: Plasma Volume and Extravascular Fluid Volume During Pregnancy and Puerperium, Am. J. Obst. & Gynec. **57:**471-481 (March) 1949.

11. Macy, I. G., and others: Physiological Adaptation and Nutritional Status During and After Pregnancy, J. Nutrition (supp. 1) **52:**1-92 (April) 1954.

12. Gordon, A. S.: Influence of Humoral Factors on Erythropoiesis, Am. J. Clin. Nutrition **5:**461-472 (July-Aug.) 1957.

13. Mellanby, E.: Vitamin A and Bone Growth: Reversibility of Vitamin A-Deficiency Changes, J. Physiol. **105:**382-399 (Jan.) 1947.

14. Howard, J. E.: Calcium Metabolism, Bones and Calcium Homeostasis: Review of Certain Current Concepts, J. Clin. Endocrinol. **17:**1105-1123 (Sept.) 1957.

15. Coryell, M. N., and others: Metabolism of Women During Reproductive Cycle: XVII. Changes in Electrophoretic Patterns of Plasma Proteins Throughout Cycle and Following Delivery, J. Clin. Invest. **29:**1559-1567 (Dec.) 1950. Reference 13.

16. Macy, I. G., and Mack, H. C.: Physiological Changes in Plasma Proteins Characteristic of Human Reproduction, Detroit, Children's Fund of Michigan, 1952.

NEW ANATOMICAL NOMENCLATURE.—An International Anatomical Nomenclature Committee was set up, and the work of this Committee resulted in the Paris Nomina Anatomica of 1955. . . . Major changes are few. One or two structures familiar in clinical practice, are however, affected. The circumflex nerve, for example, is now the axillary nerve, even though it quickly leaves the axilla and though its accompanying artery is still called the posterior humeral circumflex artery. The internal mammary artery becomes the internal thoracic artery. The accessory nerve, which has always been a little troublesome, is now described as having an internal branch (cranial part), and an external branch (spinal part). The moderator band of the right ventricle is to be known officially as the trabecula septomarginalis, and certain details of the heart valves are changed. . . . At present, in British textbooks, it is usual to name the cusps of the pulmonary valve posterior, right, and left; in the new list they are given as anterior, right, and left. Similarly the cusps of the aortic valve have been changed from anterior, right, and left to posterior, right and left. . . . A name has now been found for the "Artery Without a Name." One has often wondered why a vessel which supplies one-eighth, let us say, of the body with blood should have been called the innominate artery, or, what sounds even more casual to English ears, the B. A. (1895) term—Arteria Anonyma. Now it is to be called the brachio-cephalic trunk—not an elegant name perhaps, but at any rate, "nomen proprium," a name of its own.—R. M. Livingstone, The New Anatomical Nomenclature, *Annals of the Royal College of Surgeons of England*, May, 1958.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
Assistant to the Editor . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . CHARLES CHAPMAN

•

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

HISTOPLASMOSIS

HISTOPLASMOSIS was first described in 1906 and until about 1940 it was considered to be an acute, progressive, almost invariably fatal disease. It is now recognized that in addition to the progressive disseminated type there is a much commoner type that is benign, self-limited, and often asymptomatic.[1] According to Tegeris and Smith[2] the case fatality rate in epidemics is about 1.2%. The distribution seems to be world-wide but the disease is more prevalent in rural than in urban areas and in some rural regions than in others.[3] The causative fungus, Histoplasma capsulatum, is found in the feces of birds (especially domestic fowl), bats, dogs, and various other mammals, hence it is commonly found in the soil.

Primary infection with the development of a single tuberculoid nodule in the lung is almost always of the benign type but, if there is an overwhelming exposure to contaminated dust, multiple pulmonary lesions may result from hematogenous spread. In older patients about 50% develop cutaneous or mucocutaneous lesions (nodules, papules, ulcers, abscesses, and furuncles). The spleen may be enlarged. The patient may have a cough which is usually unproductive, chest pains of varying intensity, loss of weight, increased fatigability, and general malaise. The condition usually is first suggested when the characteristic changes are seen in a roentgenogram of the chest. As in the case of tuberculosis, a positive skin test indicates previous contact with the causative organism but gives no information regarding activity. The complement-fixation test is the only serologic test that is of much value as an index of activity, but it is so complex that it is done only in a few special laboratories.[1]

The diagnosis is difficult because neither the clinical nor the x-ray findings are pathognomonic and the disease simulates many other conditions. In endemic areas histoplasmosis in white children up to age 18 is at least eight times as common as tuberculosis.[4] Many patients with pulmonary cavities due to histoplasmosis are still admitted to tuberculosis hospitals despite the absence of any positive evidence of tuberculosis. This is unfortunate because streptomycin (and also penicillin) is contraindicated in the treatment of histoplasmosis as it favors the growth of the organisms.

The benign type of this disease requires no treatment. In the effort to find an effective treatment for the progressive type many drugs have been tried and sometimes the results reported by one observer differ radically from those reported by another. Christie[3] used sulfonamides with good results even in patients with progressive lesions. For this reason he believes these drugs may be lifesaving. The response of the patients was not apparent for a week or two but within three or four weeks the patients were well and no relapses were observed. The most controversial drug is amphotericin B. Lehan and co-workers[5] found it relatively nontoxic and suggested that it might have some therapeutic usefulness. Later they reported improvement in patients with the progressive type of lesion when the drug was given by mouth but relapse when it was discontinued. Two patients given the drug intravenously showed marked clinical and bacteriological improvement but two others with far-advanced lesions treated in this way died. Christie stated that although some favorable results with this drug have been reported it is likely to produce chills and fever and may cause renal damage. Packard and co-workers[6] used cortisone and believed that the drug probably shortened the course of the disease and saved life but reserved its use until after two weeks of illness had elapsed. This allowed the body to develop an immune reaction. Immediate use of this drug might further the spread of the disease and suppress antibody formation.

---

[1] Curry, F. J., and Wier, J. A.: Histoplasmosis, Am. Rev. Tuberc. **77**:749-763 (May) 1958.

[2] Tegeris, A. S., and Smith, D. T.: Acute Disseminated Pulmonary Histoplasmosis Treated with Cortisone and MRD-112, Ann. Int. Med. **48**:1414-1420 (June) 1958.

[3] Christie, A.: Disease Spectrum of Human Histoplasmosis, Ann. Int. med. **49**:544-555 (Sept.) 1958.

[4] Schwarz, J., and Baum, G. L.: History of Histoplasmosis 1906 to 1956, New England J. Med. **256**:253-258 (Feb. 7) 1957.

[5] Lehan, P. H.; Furcolow, M. L.; Brasher, C. A.; and Larsh, H. W.: Therapeutic Trials with Newer Antifungal Agents, Antibiotics Annual pp. 467-469, 1956-1957. Lehan, P. H., and others: Experiences with Therapy of Sixty Cases of Deep Mycotic Infections, Dis. Chest **32**:597-614 (Dec.) 1957.

[6] Packard, J. S.; Finkelstein, H.; and Turner, W. E.: Acute Pulmonary Histoplasmosis, A. M. A. Arch. Int. Med. **99**:370-375 (March) 1957.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

Additional positive steps were taken by the House of Delegates at the recent A. M. A. Clinical Meeting in Minneapolis for meeting the medical care needs of the indigent. It is my personal wish that all physicians will participate with their state and county medical societies in developing the best possible programs for public assistance recipients.

Currently there are a multiplicity of programs for medical care of the indigent under the Social Security Act. According to the law, each state must keep its programs for (1) old-age assistance, (2) aid to dependent children, (3) aid to the permanently and totally disabled, and (4) aid to the blind administratively and financially distinct. This separation leads to confusion, waste, and duplication.

To help correct this situation the Council on Medical Service recommended and the House of Delegates approved a resolution that the Social Security Act be amended by Congress to permit states to combine the present four public assistance medical programs into a single medical program, administered by a single agency and making available uniformity of services to all eligible public assistance recipients in the state.

Regarding the program administration by a single agency, the House concurred in the recommendation that each state medical association give serious consideration to the use of a "voluntary agency such as Blue Shield" or a "specific agency established by the medical society" for administering any funds provided under the public assistance provisions of the Social Security Act for medical care of the indigent.

Some state associations already use such administrative agencies, and I urge others to experiment with the use of similar mechanisms.

Because the medical profession has accepted the principle that the provision of personal health services to the needy is primarily the responsibility of the state and local governments, it now is our duty to see that the best possible programs are developed and administered at these governmental levels.

In communities where physicians prefer to provide care through their own charity, rather than being paid from welfare funds, I sincerely hope that definite programs will be established to assure that every needy person has the necessary physician's services to the extent available in the community.

Furthermore, I agree with the Council on Medical Service and the House that "medical societies establish formal liaison with governmental agencies concerned in the provision of health services to the indigent in their areas, and through such liaison they act in an advisory capacity to assure the adequacy of the health care of those who cannot meet the cost of such care through their own resources."

Finally, I believe that in some areas nonindigent and nondeserving persons now have access to public assistance services. Therefore, I concur with the Council and the House that indigent care committees must inform themselves regarding laws and regulations governing determination of eligibility and must examine both the validity of these standards and their application.

By its actions on the Council's recommendations the House has laid the foundation for a strong, medically sponsored program to implement existing policy statements concerning personal health services to the needy. It also has outlined a positive program of local action which will serve as a bulwark against further federal entry into the field of medical care. Let us provide the active and organized support needed to make the program a reality in every state and community.

Gunnar Gundersen, M.D.
La Crosse, Wis.

SCENES FROM THE MINNEAPOLIS MEETING

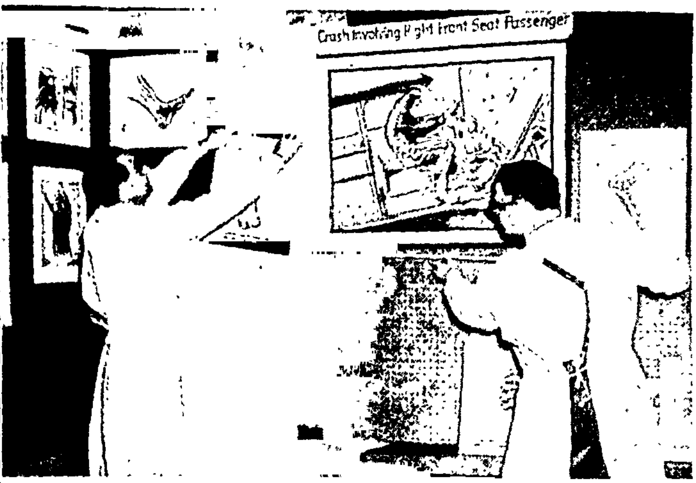
Left, A. M. A. House of Delegates during 12th Clinical Meeting in Minneapolis, Dec. 2-5, 1958.

Above, Reference Committee on Insurance and Medical Service meets to discuss resolutions introduced to House of Delegates.

Left, Dr. Gunnar Gundersen, La Crosse, Wis., A. M. A. President, addresses House of Delegates.

One of the many preconvention meetings was the Conference on Federal Medical Services.

General Practitioner of the Year, Dr. Lonnie Coffin of Farmington, Iowa, is welcomed to House of Delegates by Dr. E. Vincent Askey, House Speaker, and Dr. Louis M. Orr, A. M. A. President-elect.


Crash Involving Right Front Seat Passenger

Above, Dr. Charles V. Heck *(left),* University of Illinois College of Medicine, and Dr. Harry B. Hall, University of Minnesota Medical School, present Auditorium exhibit featuring fractures encountered by front seat passenger in auto crash.

Left, Dr. J. T. Lowe, Indianapolis, receives a copy of A. M. A.'s new pamphlet, "The Healthy Way to Weigh Less," being distributed at Council on Foods and Nutrition exhibit on weight reduction. Pamphlet will be mailed to all medical societies later this month.

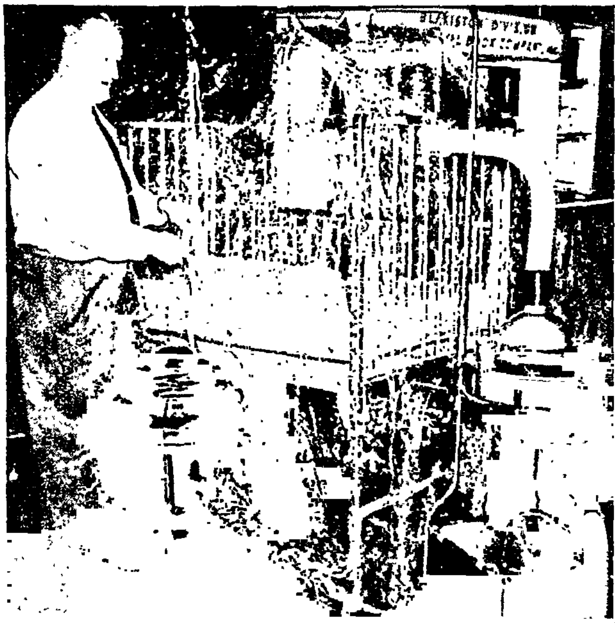
Right, Dr. Peter A. Salmon demonstrates his work with massive hemorrhage by local gastric hypothermia with wax models and a hypothermia machine. Dr. Edward W. Kieffer *(left),* Elmore, Ohio, was one of many physicians to study his work.

BLOOD SUPPLY.
CIRCULATION IS MAINTAINED FOR 30 MINUTES UNTIL THE CHEMOTHERAPEUTIC AGENT IS INTO THE TISSUE.

Chemotherapeutic application of isolated organ perfusion is outlined to Dr. Howard M. Frykman *(left)* of Minneapolis by exhibitors Dr. R. K. Ausman and medical technologist Sharon Semmill of the University of Minnesota.

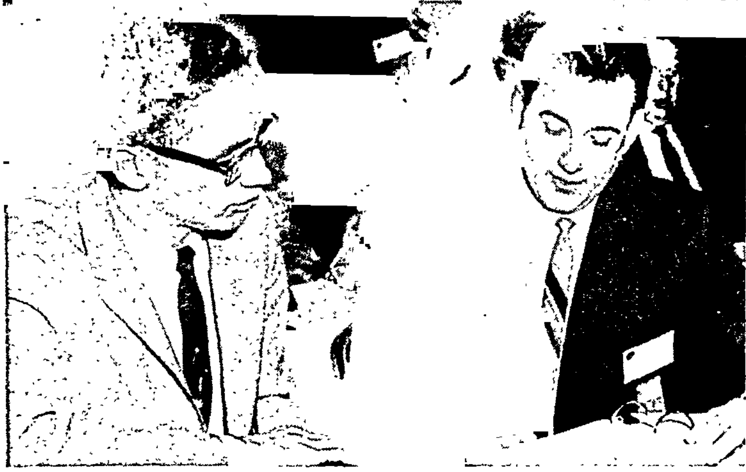
Twin coil artificial kidney is explained by Dr. John F. Maher, Georgetown University School of Medicine, to Dr. Joseph Rosenfeld *(right)* of Philadelphia.

Right, Tom Gardiner, rounding out 50 years of service on A. M. A. staff, attends his last Clinical Meeting before retiring Jan. 1. He checks operational schedule of meeting with his secretary for 16 years, Miss Rita Huster, in the Auditorium.



Above, Tom Creagh of Chicago was an early bird in setting up demonstration of cold steam humidifier in Industrial Exhibition.

Right, Dr. Herman Kleinman, in "Indian Medicine in Minnesota" exhibit in Auditorium, is awarded feathered finery for his work on Redlake Indian Reservation.



Seated as representatives of Student American Medical Association are Marvin J. Chapman *(left),* University of Wisconsin Medical School, and William Kirkham, University of Oklahoma Medical School. They are S. A. M. A. regional vice-president and treasurer respectively.

Mrs. Arthur E. Underwood of Vancouver, Wash., President of Woman's Auxiliary to A. M. A., addresses House of Delegates.

MEDICAL NEWS

ARKANSAS

County Society Aid for Research Laboratory.—The Pulaski County Medical Society gave $10,187 to the University of Arkansas Medical Center, Little Rock, Oct. 17 to establish a Virus Research Laboratory in the proposed new 2-million-dollar Research Wing to be built at the center. The check was presented to Dr. F. Douglas Lawrason, provost for medical affairs, by Dr. Hoyt Choate, society president, and Dr. Jerome S. Levy, chairman of the society's Committee for Distribution of Surplus Funds. The money will be matched by federal funds in the construction of the Research Wing. The government has allocated $1,066,000 to the university. Dr. Choate said the reserve money had been building up in the society's funds for a number of years. Out of a large number of possible uses that were considered, it was decided unanimously by the committee that it could best be utilized at the Medical Center.

CALIFORNIA

New Deadline for Heart Research Funds.—A new deadline—Feb. 1, 1959—has been established for applications for research funds from the Los Angeles County Heart Association. The deadline formerly was April 15. Decision to advance the final date for applications was announced by Dr. Mitchel D. Covel, chairman of the Research Committee. Dr. Covel said the earlier deadline is to the advantage of local investigators because their applications can be distributed by the California Heart Association through the state and in turn attract additional funds to local investigators from other chapters. As changes have been made in application methods, investigators are advised to contact the Heart Association at 660 S. Western Ave., Los Angeles, DUnkirk 5-4231, for a copy of the New Application Information bulletin. Under the new schedule, applications will be referred to study sections of the committee by Feb. 10. Final notification of awards will be made on June 1 and projects will be funded on July 1.

DISTRICT OF COLUMBIA

Campaign for Hospital Research Center.—Children's Hospital of the District of Columbia has launched a campaign to raise $460,000 to complete its new Research Center and finance other improvements to the hospital at a total cost of $1,117,357. Grants totaling $457,357 and a $200,000 pledge from the Variety Club of Washington, D. C., were received before the campaign opened. The Research Center is now under construction at Twelfth and W. Sts., N.W. Scheduled for completion in January, 1959, the building will cost about $800,000. The three-story structure will provide facilities for research in allergy, antibiotics, adolescent medicine, cystic fibrosis, hematology, psychiatry, renal diseases, and viral diseases. Movable partitions will allow rearrangement of research areas without extensive repairs. Research is currently conducted in scattered laboratories within the hospital. New parking facilities, air conditioning, an expended medical library, a psychiatric center, and a recovery room are among the other projects to be financed by campaign funds.

FLORIDA

Study of Caribbean Tropical Disease.—Twelve University of Miami graduate students in medicine and zoology will study tropical diseases and parasitology in Central America and the Caribbean as a result of a $19,000 educational grant received by the university from the National Institutes of Health, Washington, D. C. J. Walter Beck, Ph.D., associate professor of microbiology, will accompany six medical students to Costa Rica for a month's study of parasites and tropical disease. W. Henry Leigh, Ph.D., professor of zoology, and Dr. Ralph Jones Jr., chairman of the department of medicine, will supervise the training program. Another group of six graduate physicians who are residents specializing in internal medicine will undertake similar studies in Jamaica. In Costa Rica, the San Juan de Dios Hospital of San Jose will be headquarters while in Jamaica the training program will stem from the British Medical College of the West Indies.

HAWAII

Colonel Hughes Receives Award.—The Wellcome Prize was awarded to Lieut. Col. Carl W. Hughes, M. C., U. S. Army, Nov. 19, at the 65th annual convention of the Association of Military Surgeons of the United States. Colonel Hughes, a native of Missouri, is chief of general surgery service at Tripler Army Hospital in Honolulu. The Wellcome Prize is presented annually at the discretion of the association for "the best essay on medico-military affairs prepared by one of its members." The prize consists of a silver medal, a scroll, and an honorarium of $500. The Wellcome Prize essay for 1958 is entitled "Vascular Surgery in the Armed Forces."

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

MASSACHUSETTS

Workshop on Instrumentation.—A five-day Instrumentation Workshop will be held April 13-17, 1959, at Harvard Medical School, Boston, under the auspices of the Clinical Pathology Committee of the New England Society of Pathologists. The workshop covers actual participation in:

1. Use of Beckman DU spectrophotometer and
2. pH meters
3. Assembling ammeter-voltmeter for your own use
4. Trouble shooting on photometers
5. Studying blood pH methodology
6. Constructing spectral absorption curves in visible and ultraviolet
7. Photofluorimetry
8. Practical program of laboratory maintenance.

Registration should be made immediately.

MICHIGAN

Distinguished Citizen's Award.—The Dearborn Chamber of Commerce has announced that Dr. Sidney E. Chapin won its "Distinguished Citizen's Award" for 1958. The presentation was made Oct. 28. Dr. Chapin is secretary of the Michigan Heart Association, is chairman of both the Health Federation, United Community Services of Detroit, and Public Relations Committee of the Wayne County Medical Society, has served as chairman of Dearborn Public Health Committee and the Steering Committee of Child Guidance Project West Wayne County, and is the vice-president of Detroit Men's Council Navy League of the U. S.

MISSOURI

Name Chairman of Nutrition Committee.—Dr. Robert L. Jackson, chairman, department of pediatrics, University of Missouri School of Medicine, Columbia, has been appointed chairman of the Committee on Infant Nutrition by the Food and Nutrition Board of the National Research Council, Washington, D. C. The Committee on Infant Nutrition has the responsibility of accumulating and interpreting scientific data on infant nutrition, defining the unsolved problems, and pointing out areas for future research. It also advises the National Research Council on revision of recommended dietary allowances. Establishment of the committee was authorized by the Food and Nutrition Board last spring. Other members of the committee are Dr. Harry H. Gordon, Baltimore; Dr. Paul Gyorgy, Philadelphia; Wendell H. Griffith, Ph.D., Los Angeles; Dr. Charles U. Lowe, Buffalo, N. Y.; and Dr. Joseph A. Johnston, Detroit.

NEBRASKA

Psychiatric Institute Wins Award.—The Nebraska Psychiatric Institute received the 1959 Mental Hospitals Achievement Award of the American Psychiatric Association. The association's silver plaque was conferred on the Omaha institution "in recognition of its leadership in creating a statewide mental health program." The award was presented at the 10th Mental Hospital Institute by Dr. Mathew Ross, medical director of the American Psychiatric Association, to Dr. Cecil Wittson, director of the institute. The citation read: "Nebraska's decision to invest in a psychiatric research and training facility, rather than just adding more hospital beds, has paid dividends in a dynamic program that has benefited the entire state and aids the Dakotas and Iowa." Community clinics and orientation courses for clergymen, teachers, and general practitioners aided in the program. Nebraska has pioneered in the use of an interstate telecommunication system and closed-circuit television for training in psychiatric centers.

NEW YORK

Dr. Wagner Named Executive Director.—Dr. Herbert T. Wagner, Bronxville, became the new executive director of the Medical Society of the State of New York Dec. 1, it was announced by Dr. Leo E. Gibson, Syracuse, president of the society whose headquarters are at 750 Third Ave., New York City. Dr. Wagner will take over the management of the society's staff of 70 employees who work in the membership and directory departments, the Bureau of Industrial Health and Workmen's Compensation, the Bureau of Medical Care Insurance, and the Bureau of Public and Professional Relations. The society, which last year celebrated its 150th anniversary, also publishes the *New York State Journal of Medicine*. Dr. Walter P. Anderton, secretary of the society for many years, who formerly had the dual position of secretary-general manager, will continue as the society's elected secretary.

Establish Institute for Rheumatic Fever.—New York University and Irvington House have agreed to establish the Irvington House Institute for Rheumatic Fever and Allied Diseases as a part of New York University–Bellevue Medical Center. The institute will be housed in the new University Hospital. Irvington House will underwrite the cost of $500,000 toward the construction of the treatment, research, and clinical facilities. Both Irvington House and the Medical Center have been responsible for original research on rheumatic fever. Irvington House, at Irvington-on-Hudson, is a hospital and research center for children afflicted with diseases of the heart. Since its beginning in 1920, it has cared for over 5,800 children. The university and Irvington House, while joining in the creation and operation of the institute, will continue to function as autonomous, financially independent institutions. New York University–Bellevue Medical Center will appoint the central committee of the institute, to function as a communications center for the research programs in rheumatic fever and those allied diseases which are initiated by streptococcal infection. Members of the Irvington House Medical Advisory Committee will be nominated by the university and elected by the Irvington House board.

New York City

Hospital News.—A $350,000 project involving the installation of a postoperative recovery unit and expansion of the operating theatre and the x-ray department has been completed by The Bronx Hospital, Dr. Aaron A. Karan, hospital director, has announced. The three facilities are housed on the eighth floor of the main building. A $172,000 grant from the Ford Foundation paid for half the cost of the project. The other 50% expense was met by the Federation of Jewish Philanthropies and the hospital's own building fund resources.

NORTH CAROLINA

Dr. Warren Goes to Texas.—Dr. James V. Warren, professor of medicine at the Duke University Medical Center, Durham, has left to become chairman, department of internal medicine, University of Texas Medical School, Galveston. A Duke faculty member since 1952, Dr. Warren is known for his research on heart disease. Two years ago he visited Africa as a member of an international team which made a blood pressure study of giraffes, a project conducted under a contract between Duke and the U. S. Office of Naval Research to provide data related to the problem of blackouts among high-speed aircraft pilots. Dr. Warren served in 1952 as president of the American Federation for Clinical Research. He is a member of the editorial boards of the *"American Heart Journal," "Heart Bulletin,"* and the cardiovascular section of *"Excerpta Medica."*

PENNSYLVANIA

Philadelphia

Dedicate Quarters for New School.—The School of Allied Medical Professions of the University of Pennsylvania dedicated its new quarters at 39th and Pine Streets, Philadelphia, Nov. 25. The building is a completely renovated former convent. Following a tour by 90 guests representing local, state, and national health, rehabilitation, and educational agencies, Basil O'Connor, president of the National Foundation, spoke on "Careers that Count." The building makes it possible for various programs of the School of Allied Medical Professions to be housed under one roof. These programs include physical therapy, occupational therapy, medical technology, and oral hygiene. Administrative and instructional activities of the school were moved into the new quarters Sept. 1.

Dr. Hodes Named to Head Radiology Department.—The Board of Trustees of Jefferson Medical College has appointed Dr. Philip J. Hodes as professor and head of the department of radiology and as attending radiologist of Jefferson Hospital succeeding Dr. Russell L. Nichols. Dr. Hodes has been professor of radiology at the Medical School and at the Graduate School of Medicine, University of Pennsylvania since 1952. He has also been associate in radiology at the hospital of the University of Pennsylvania since 1955. In Philadelphia he is consultant for the U. S. Naval Hospital, The Veterans Administration Hospital, and Jeanne's Hospital; and in Washington, Walter Reed Army Hospital, and the Armed Forces Institute of Pathology. He is a diplomate of the American Board of Radiology and a past-president of the Philadelphia Roentgen Ray Society.

Begin Construction on Research Building.—The University of Pennsylvania School of Medicine has begun construction on its new Research Building, a $3,100,000 structure, to be devoted solely to medical science research. An additional building is planned for the department of biology and is to be located adjacent to the Medical Research Building. Classrooms, libraries, and offices of the School of Medicine Building, laboratories of the Medical Research Building, and the college's departments of biology and zoology will all be interconnected. The research building itself will be characterized by four seven-story towers connected by a common, central section. When completed the building will be occupied by the departments of microbiology and physiology, the Phipps Institute section of the department of public health and preventive medicine, the Harrison department of surgical research, and the Johnson Foundation for biophysical research. It is being financed by the university and the U. S. Public Health Service under the Federal Research Facilities Act. The University's contribution of $1,600,000 will be matched by a Public Health Service grant of $1,500,000.

GENERAL

Survey of Research in Tropical Medicine.—A survey to determine the adequacy of research and training in tropical medicine in the United States will be undertaken by the National Research Council, Washington, D. C., with financial support from the National Institutes of Health, the Department of Defense, and The Rockefeller Foundation. The foundation is contributing $26,000 over a three-year period. The survey will seek information on the status of tropical diseases which affect human beings and animals and are of economic importance, and will evaluate the research and development work now in progress. A special staff appointed by the National Research Council will conduct the study and formulate recommendations.

Award for Cancer Research.—The Ann Langer Cancer Research Foundation has announced an annual award of $500 for meritorious investigation in the field of cancer research, either clinical or laboratory. The award is being supported by the family of the late Bertha Goldblatt Teplitz. Competition shall be limited to physicians and other scientists under the age of 45. The Award Committee consists of Drs. Austin M. Brues, Israel Davidsohn, Danely P. Slaughter, Albert Tannenbaum, and William B. Wartman, of Chicago. Nominations should be submitted to Tiplitz Award Committee, 612 N. Michigan Ave., Chicago 11 by Feb. 1, 1959, and should be accompanied by a short one-page statement and biography.

Plans for New Library of Medicine.—Preliminary plans for the new building of the National Library of Medicine have been submitted to the Public Buildings Service, the Public Health Service has announced. The new building will be constructed on the grounds of the National Institutes of Health in Bethesda, Md. Plans call for 232,000 square feet of space, on five levels, three of which will be below ground level. The 85th Congress appropriated 7 million dollars for construction, which will begin in spring, and the building is expected to be completed in 1961, the 125th anniversary of the library's founding. The National Library of Medicine, operated by the Public Health Service of the Department of Health, Education, and Welfare, is reportedly the largest medical library in the world.

Prize for Medico-Surgical Film.—The "Annual Prize for Medico-Surgical Cinema," which comprises 100,000 francs cash (with possibility of being divided) and various other awards, will be given during the last session of the course of "Actualities Medico-Chirurgicales" at the "Nouvelle Faculte de Medicine de Paris" March 17, 1959. The didactic value of the film as well as its properly cinegraphic quality will be considered. Only the 16 mm. size film will be admitted. Candidatures and films are to be sent to the "Secretariat du Journal La Presse Medicale," 120 Boulevard Saint Germain, Paris VI°, prior to Feb. 15, 1959. Awards will be remitted to the authors of the best films. Contrary to the preceding years, all the films may be given awards, including those subsidized or produced by a laboratory or firm.

Chilean Physician Visits U. S. Schools.—Dr. Ramon Ortuzar, of Santiago, Chile, chairman, medical department, Catholic University of Chile, recently visited Georgetown University, Washington, D. C., to study ways and means of expanding and improving his institution's staff. He is visiting under a W. K. Kellogg Foundation grant to see how clinical medicine is taught in selected medical centers, and to study the relation between clinical medicine and basic science. At present, Dr. Ortuzar pointed out, the Catholic University of Chile admits only 35 students per class. Dr. Ortuzar has visited medical schools at the University of Colorado, Vanderbilt University, the University of Kansas, Western Reserve University, and Washington University of St. Louis. After leaving Georgetown, his schedule took him to Harvard, Johns Hopkins, Yale, Cornell, and Columbia.

Orthopedic Surgeons Meet in Chicago.—The 26th annual meeting of the American Academy of Orthopaedic Surgeons, will be held Jan. 24-29 at the Palmer House, Chicago. The presidential address will be given by Dr. H. Reton McCarroll the morning of Jan. 26. Papers to be presented by special invitation are as follows:

Experiments in Immunity in Cancer, Dr. Gordon Murray, Detroit.
Recent Advances in the Reconstructive Surgery of Major Arterial Lesions, Dr. Robert Linton, Brookline, Mass.
The Role of the Surgeon in Disaster Management, Col. Joseph Schaeffer.

An audio-visual program will be continued each day of the meeting and will include eight films produced by foreign physicians. Alumni meetings, instructional courses, and scientific exhibits are planned. For information write the American Academy of Orthopaedic Surgeons, Inc., Mr. John K. Hart, 116 S. Michigan Ave, Chicago 3, Executive Secretary.

Dr. Horwitz to Succeed Dr. Soper.—Dr. Abraham Horwitz, of Chile, has been elected director of the Pan American Sanitary Bureau, to assume office Feb. 1, 1959, succeeding Dr. Fred L. Soper, whose third four-year term of office ends Jan. 31, 1959. As the Pan American Sanitary Bureau is the Regional Office for the Americas of the World Health Organization, Dr. Horwitz's name will be presented to the executive board of WHO for appointment as the Regional Director for the Americas of that organization. Dr. Horwitz is presently assistant director of the National Health Service of his country, on leave from his position as director of the School of Public Health, University of Chile. From 1950 to 1953 he served in the Pan American Sanitary Bureau's Washington headquarters and was chief of the Professional Education Branch when he resigned to accept his present post in Chile. The Pan American Sanitary Conference meets once every four years to elect the director, to study health problems in the hemisphere, and adopt a program and budget.

Traffic Deaths Continue to Decrease.—The National Safety Council has reported a 1% drop in September traffic deaths from the same month last year.

The traffic death toll for the nation at the end of nine months still was 6% below the same date last year—26,180 in 1958 against 27,770 in 1957. The council estimated that traffic accidents in the first nine months of 1958 also brought disabling injuries to about 900,000 persons. The highway death total for September was 3,300, as compared with 3,330 for September last year. September was the 13th month in a row and the 21st in the last 22 to show a drop in deaths from the same months of the year before. The only lapse came in August, 1957. The downward trend began in December, 1956. Vehicular travel across the nation went up 2% in the first seven months of this year (latest figure available). Traffic deaths went down 7% in the same period. This produced a mileage death rate (number of traffic deaths per 100 million vehicle miles) of 5.1—lowest on record for the first seven months of any year and 9% below the rate of 5.6 for the same period last year.

Surgeons Meeting in Houston.—Physicians are invited to a sectional meeting of the American College of Surgeons in Houston, Texas, Feb. 2-4 at the Shamrock Hilton Hotel. Reports in general surgery, a full day's otolaryngology program, a cancer workshop, and hospital clinics will comprise the three-day meeting. Dr. Jesse G. Heard, Houston, associate professor of surgery, Baylor University, is chairman of the Advisory Committee on Local Arrangements. General sessions will include discussions on tumors, varicose veins, preparation of parents for parenthood, cancer, radiation hazards, diseases of the pancreas, gastrointestinal tract bleeding, and other topics. Dr. Isidor S. Ravdin, chairman, Board of Regents, will act as moderator at the fellowship luncheon discussion on college activities Feb. 3. A motion picture program will be presented the evening of Feb. 2, with Dr. William D. Seybold, Houston, presiding. The Houston Ophthalmological and Otolaryngological Society has collaborated in preparing the otolaryngology program for Feb. 2, Dr. James C. Dickson, presiding. Dr. H. Prather Saunders, associate director, The American College of Surgeons, 40 E. Erie St., Chicago 11, is in charge of all sectional meetings for the college.

Awards in Arthritis and Heart Disease.—The Gairdner Foundation has announced its first international awards in arthritis and heart disease, totaling $40,000. The award of merit has been awarded to Dr. Alfred Blalock and Dr. Helen B. Taussig, of Johns Hopkins University, Baltimore, for their initial development of the "blue-baby operation." Three Gairdner Foundation annual awards of $5,000 each have been given to Dr. Harry M. Rose and Dr. Charles Ragan, of New York City, "for their discovery of the first practical laboratory test for the diagnosis of rheumatoid arthritis"; Prof. W. D. M. Paton and Dr. Eleanor Zaimis, of London, England, "for their discovery of the first drugs to be proven practical and effective in treatment of high blood pressure"; Dr. W. G. Bigelow, of Toronto, Ontario, Canada, "for his development of the technique of hypothermia, or the 'deep freeze' operation for heart surgery." The Foundation's funds derive from gifts of J. A. Gairdner, a Canadian industrialist, and members of his family. Mr. Gairdner was a former President of The Canadian Arthritis and Rheumatism Society from 1949 to 1952 and Chairman of its National Board of Directors from 1952 to 1958. The awards are for achievement and not grants for support of future research. The awards are to be presented at ceremonies to be held in Toronto on May 15-16, 1959, and winners will come to Toronto to participate in scientific meetings arranged in cooperation with the University of Toronto.

Physicians Nominated for Football Honor.—The names of 72 senior football lettermen of the class of 1934, honored by their alma maters with nomination for *Sports Illustrated's* Silver Anniversary All-America, have been submitted to the judges which will name the 25-man roster. Twelve of the nominees have earned distinction in the field of medicine. The annual competition seeks to "emphasize the pursuit of the rounded human values in which athletics and education are joined" through honoring those players who have most distinguished themselves in their chosen fields of life. Only participation by a senior on a 1933 varsity team, not star performance, is the condition of nomination. Doctors nominated this year are:

Wilford L. Cooper, (nominated by Abilene Christian College) head, department of proctology, Lexington, Ky., Clinic; Joseph M. Teta, (Alfred University) general practitioner, Long Island, N. Y.; Frank B. McGlone, (University of Colorado) specialist in gastroenterology; Paul A. Kennedy, (Georgetown University) Buffalo, N. Y., chairman of the Surgical Section of the New York Medical Society; David Eli Kopans, (Harvard University) specialist in gynecology and obstetrics, Boston; Owen B. Murphy, (University of Kentucky) orthopedic surgeon; John V. Prevost, (Lafayette College) former Navy medical officer in private practice in Wellsboro, Pa.; George Linton Wolcott, (Lehigh University) medical director and assistant vice-president of the Bristol-Myers Company, New York City; George F. Parke, (Montana State College) chief of staff of the Centralia, Washington General Hospital; Ray E. Burger, (University of Virginia) physician and surgeon, Welch, W. Va.; Charles H. Brown, (Wesleyan University) professor of medicine and member of staff at Cleveland Clinic Foundation and Cleveland Clinic Hospital; Charles M. Barrett, (Xavier University) professor of radiation therapy, University of Cincinnati.

Society News.—The Central Neuropsychiatric Association has elected the following officers for the current fiscal year: president, Dr. Hamilton F. Ford, Galveston, Texas; president-elect, Dr. Martin H.

Hoffmann, Detroit; vice-president, Dr. Oscar B. Markey, Cleveland; and secretary-treasurer, Dr. Ralph M. Patterson, Columbus, Ohio. The next meeting will be held in New Orleans, Oct. 16-17, 1959.—The following officers were elected at the recent meeting of the **North Central Medical Conference** Oct. 11-12: Dr. Lien O. Simenstad, Osceola, Wis., president-elect for the year 1960; secretary, Mr. Harold W. Brunn, who will become executive secretary of the Minnesota State Medical Association Jan. 1, 1959; secretary-emeritus, R. R. Rosell, who is now executive secretary of the Minnesota State Medical Association and who will retire Dec. 31. President-elect for 1959 is Dr. Arthur J. Offerman, Omaha.—At the interim meeting of the **American Institute of Ultrasonics in Medicine** held Aug. 23 Dr. Jerome W. Gersten, Denver, was elected president and Dr. John H. Aldes, Los Angeles, was elected secretary-treasurer.—Dr. William S. Kroger, clinical associate professor of obstetrics and gynecology, Chicago Medical School, was elected president of the **Academy of Psychosomatic Medicine** at its recent annual meeting in New York City. Other officers are: Dr. Maury D. Sanger, Brooklyn, vice-president; Dr. Bertram B. Moss, Chicago, secretary; Dr. Zale A. Yanof, Toledo, Ohio, treasurer; and Dr. Morris M. Peshkin, New York City, historian. Dr. Wilfred Dorfman, of Brooklyn, as president-elect, will succeed to the presidency at the sixth annual meeting of the academy next October at Cleveland.—Dr. James C. Overall, of Nashville, Tenn., has been elected president of the **American Academy of Pediatrics** for the year ending in October, 1959, and Dr. William W. Belford, of San Diego, Calif., vice-president. The Executive Board members elected for the coming year are: Drs. Richard C. Eley, Boston; George M. Wheatley, New York City; Carl C. Fischer, Philadelphia; William Weston Jr., Columbia, S. C.; James G. Kramer, Akron, Ohio; Harold F. Flanagan, St. Paul, Minn.; Clarence H. Webb, Shreveport, La.; Frank H. Douglass, Seattle; George H. Schade, San Francisco; and Anibal Ariztia, Santiago, Chile.—The **Clinical Orthopaedic Society** has elected the following officers: president, Dr. Atha Thomas, Denver; vice-president, Dr. Robert C. Robertson, Chattanooga, Tenn.; secretary-treasurer, Dr. Charles H. Frantz, Grand Rapids, Mich.; senior member, Dr. Kerwin A. Fischer, Louisville, Ky. (Membership Committee); junior member, Dr. Charles H. Herndon, Cleveland (Membership Committee).

CANADA

Institute for Mentally Ill Accredited.—The Board of Commissioners has approved the recommendation of the American Psychiatric Association that the Albert Prevost Institute, Montreal, be accredited. This is the result of a survey of the premises, a study of the records, and an inspection of all the services made by the inspectors of the Central Inspection Board who published a report to th effect over the signature of Dr. Douglas A. Johnsto The accreditation was granted, the standards bei in conformity with the requirements for an instit tion specialized in the treatment of the mentally i

Surgeons Meet in Vancouver.—Surgeons and relat medical personnel are invited to attend the three-day Sectional Meeting of the American College of Surgeons in Vancouver, British Columbia, Feb. 26-28, 1959. Headquarters will be the Hotel Vancouver. The program will include reports on plastic surgery of the hand, varicose veins, the bad risk surgical patient, athletic injuries, arterial injuries, the control of diagnostic radiology, treatment of breast cancer, surgical treatment of head and neck cancer, and diseases of the pancreas. Symposiums on infections, trauma, and cancer will be presented. Selected medical motion pictures and cine clinic films from the 1958 clinical congress will be shown. Dr. William L. Sloan, Vancouver, will represent the American College of Radiology in his report on Thursday afternoon which is one of a series being presented at each of the 1959 Sectional Meetings of the American College of Surgeons, as a co-operative program between both colleges on the subject of patient exposure from diagnostic x-ray. On Saturday the program will emanate from Vancouver General Hospital. Canadian doctors will present reports on cancer of the thyroid gland, parathyroid tumors, parotid tumors, hip fractures, and frozen sections in surgery. Dr. H. Prather Saunders, Associate Director, the American College of Surgeons, 40 E. Erie St., Chicago 11, is in charge of all sectional meetings for the college.

FOREIGN

Meeting on *Pneumoconioses*.—Experts from 10 countries met recently at the International Labor Organization headquarters, Geneva, Switzerland, on the international classification of radiographs of pneumoconioses. The agenda was opened by Mr. Abbas Ammar, assistant director-general of the International Labor Organization. Prof. Gernez-Rieux, director of the Pasteur Institute at Lille, was elected chairman of the meeting. The experts came from Belgium, France, the Federal Republic of Germany, Italy, Poland, Switzerland, the Union of South Africa, the United Kingdom, the United States, and the U. S. S. R. Representing the U. S. was Dr. Robert H. Flinn, chief, Division of the Health, Bureau of Mines, the Department of the Interior.

CORRECTION

Myocardial Failure in Toxemia of Pregnancy.—In the Dec. 20, 1958, issue of The Journal, page 2191, the sixth word in the 28th line of the Medical Literature Abstract entitled "Myocardial Failure in Toxemia of Pregnancy," should have read "ST" rather than "5T."

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least six weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications was Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

Alabama: *Written.* Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

Alaska:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

Arizona:* *Written Examination and Reciprocity.* Phoenix, Jan. 14-16. Sec., Dr. Thomas H. Bate, 2910 North 7th Ave., Phoenix.

Arkansas:* *Examination and Reciprocity.* Little Rock, June 11-12. Sec., Dr. Joe Verser, Harrisburg.

Connecticut:* *Regular. Examination.* Hartford, March 10-12. Acting Sec., Dr. Louis P. Hastings, 160 St. Ronan St., New Haven. *Homeopathic. Examination.* Derby, Jan. 13. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

Delaware: *Written Examination and Endorsement.* Dover, Jan. 13-15, Jan. 22. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

Florida:* *Examination.* Miami Beach, June 22-24. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami 36.

Georgia: *Examination and Reciprocity.* Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

Guam: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

Hawaii: *Examination.* Honolulu, Jan. 12-13. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

Idaho: *Examination and Endorsement.* Boise, Jan. 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

Illinois: *Examination and Reciprocity.* Chicago, Jan. 26-30. Supt. of Registration, Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

Kansas:* *Examination.* Kansas City, Jan. 16-17. *Reciprocity.* Kansas City, Jan. 14. Sec., Dr. F. J. Nash, 364 New Brotherhood Bldg., Kansas City.

Maine: *Examination.* Portland, March 10-12. *Endorsement.* Portland, March 12. Sec., Dr. Adam P. Leighton, 142 High St., Portland.

Massachusetts: *Examination.* Boston, Jan. 13-16. Sec., Dr. Robert C. Cochrane, State House, Room 37, Boston 33.

Minnesota:* *Examination.* Minneapolis, Jan. 20-22. *Reciprocity.* St. Paul, February. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul.

Missouri: *Examination.* Kansas City, Jan. 9-10. Exec. Sec., Mr. John A. Hailey, Box 4, Jefferson City.

Montana: *Examination and Reciprocity.* Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

Nebraska:* *Examination.* Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

New Hampshire: *Examination and Endorsement.* Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

New Mexico:* *Examination and Reciprocity.* Sante Fe, May 18-19. Sec., Dr. R. C. Derbyshire, 227 East Palace Ave., Santa Fe.

New Jersey: *Examination.* Trenton, Jan. 20-23. Sec., Dr. Royal A. Schaaf, 28 W. State St., Trenton.

North Carolina: *Reciprocity.* Southern Pines, Jan. 17. *Examination.* June. Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

North Dakota: *Examination and Reciprocity.* Grand Forks, Jan. 7-10. Sec., Dr. C. J. Glaspel, Grafton.

Oklahoma:* *Examination.* Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

Oregon:* *Examination.* Portland, Jan. 6-7. *Reciprocity.* Portland, Jan. 8-10. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

Pennsylvania: *Examination.* Philadelphia, Jan. 7-10. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

Puerto Rico: *Examination and Reciprocity.* San Juan, March 3. Acting Secretary, Dr. Herminio Mendez Herrera, Box 9156, Santurce.

Rhode Island:* *Examination.* Providence, Jan. 8-9. Admin., Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

South Dakota:* *Examination.* Sioux Falls, Jan. 20-21. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

Utah: *Examination.* Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

Washington:* *Examination.* Seattle, Jan. 12-14. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

West Virginia: *Examination and Reciprocity.* Charleston, Jan. 5-7. Sec., Dr. Newman H. Dyer, State Office Bldg. No. 3, Charleston 5.

Wisconsin:* *Examination and Reciprocity.* Madison, Jan. 13-15. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., 1 West Wilson St., Madison.

Wyoming: *Examination and Reciprocity.* Cheyenne, Feb. 2. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Arkansas: *Examination.* Little Rock, May 4-5. Sec., Dr. S. C. Dellinger, University of Arkansas, Fayetteville.

Connecticut: *Examination.* New Haven, Feb. 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

Florida: *Examination.* Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

Iowa: *Examination.* Des Moines, Jan. 13. Sec., Dr. Elmer W. Hertel, Wartburg College, Waverly.

Kansas: *Examination.* Kansas City, June. Sec., Dr. L. C. Heckert, Pittsburg.

Michigan: *Examination.* Ann Arbor and Detroit, Feb. 12-13. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., West Michigan Ave., Lansing.

Minnesota: *Examination.* Minneapolis, Jan. 6-7. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

New Mexico: *Examination.* Santa Fe, Jan. 18. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

Oklahoma: *Examination.* Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

Rhode Island: *Examination.* Providence, Feb. 18. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

Tennessee: *Examination.* Memphis, Dec. 31-Jan. 1. Sec., Dr. O. W. Hyman, 62 South Dunlap St., Memphis 3.

Texas: *Examination.* April 1959. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

Washington: *Examination.* Seattle, Jan. 7-8. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

---

*Basic Science Certificate required.

GOVERNMENT SERVICES

AIR FORCE

Award of Commendation Medal.—Lieut. Col. Frederick S. Spiegel, M. C., recently was presented the Air Force Commendation medal by the director of professional services in the surgeon general's office. Doctor Spiegel was cited for planning and putting into operation a new procedure for processing of medical examinations for Air Force Academy candidates for the class of 1962 and developing new procedures and establishing additional centers for administration of medical examinations. He is a senior flight surgeon and is board-certified in aviation medicine.

SOCIAL SECURITY

Disability Evaluation.—The Social Security Administration's Medical Advisory Committee has developed, with the cooperation of the medical professions, a sound and workable method of determining disability. This difficult task has been accomplished in a way which does not interfere with doctor-patient relationships. The social security law provides monthly disability insurance payments for disabled persons aged 50 or over and for their dependents. Those who are disabled before reaching 50 years may "freeze" their social security records to prevent their future benefits from being reduced or lost entirely. Under the law, a person is considered disabled if he is unable to do any substantial gainful work, and his condition is expected to continue indefinitely. Under the system worked out for determining whether the disability requirement is met, a person who applies for disability insurance benefits or to have his social security record frozen is first asked to get a statement from his physician. The physician is asked to report clinical findings—the results of medical tests and laboratory examinations. The decision as to whether or not the person is disabled is made by a team of trained people, including a physician, in a state agency. They study not only the medical findings but also the person's education and experience. In most states this team is in the state vocational rehabilitation agency. The state vocational rehabilitation agency also considers the possibility of providing rehabilitation services to the disabled person. Thus the social security disability program has provided a new opportunity for getting more disabled people in touch with rehabilitation agencies. Disability evaluation is not a static process but must keep pace with medical progress, according to Secretary Fleming.

PUBLIC HEALTH SERVICE

Neuropharmacology Research Center.—The new research center for the study of drugs and their use in the treatment of mental illness which was opened Nov. 20 at Saint Elizabeths Hospital, Washington, D. C., will be operated jointly by Saint Elizabeths and the U. S. Public Health Service's National Institute of Mental Health. This clinical research center is being set up in the William A. White Building, which has been adapted to accommodate the research facilities and which houses 350 patients. The center is being equipped for a comprehensive, scientific assessment of the tranquilizing and energizing drugs and their effects on mental function.

Dr. Joel Elkes, National Institute of Mental Health pharmacologist and former chairman, department of experimental psychiatry, University of Birmingham in England, is director of the center.

Dr. Winfred Overholser, superintendent of Saint Elizabeths, said "This program, I believe, holds particular promise not only for Saint Elizabeths but for psychiatry in general. I am confident that this carefully planned research undertaking will bring forth knowledge that will guide us in the use of drugs and from which new effective treatment methods will evolve." Working together on the project will be psychiatrists, psychologists, pharmacologists, biochemists, physiologists, and other research specialists.

Neurologists' Mission to the Soviet Union.—In accord with an agreement between the United States and the Soviet Union to exchange missions in various fields, the National Institute of Neurological Diseases and Blindness is sponsoring a study team of six American scientists who will survey the status of neurology in the Soviet Union. The study team departed for Russia, Nov. 18, and will remain there about 30 days. The members of the mission are Dr. Francis M. Forster, chairman, department of neurology, Wisconsin University School of Medicine; Dr. Nathan Woolsey, research professor of neurophysiology, University of Wisconsin; Dr. Paul I. Yakovlev, professor of neuropathology at Harvard University Medical School; Dr. Louis S. Goodman, professor of pharmacology, Utah University School of Medicine; Dr. Henry W. Woltman, professor of neurology, Mayo Foundation Graduate School; and Dr. Karl Frank, neurophysiologist, National Institute of Neurological Diseases and Blindness, National Institutes of Health. A group of Soviet specialists will make a similar study on neurology in the United States at a later date.

DEATHS

Abbott, Leigh Gates Ⓜ Orleans, Vt.; University of Vermont College of Medicine, Burlington, 1945; certified by the National Board of Medical Examiners; specialist certified by the American Board of Surgery; veteran of World War II; interned at Worcester City Hospital in Worcester, Mass., and served a residency at St. Vincent Hospital in Worcester; captain in the medical reserve corps of the U. S. Army from July 8, 1946 to July 2, 1948; member of the school board; on the staffs of the Broadview General Hospital and Orleans County Memorial Hospital in Newport Oct. 15, aged 35, of coronary thrombosis.

Andress, David Gustavus Ⓜ Madrid, Ala.; Chattanooga (Tenn.) Medical College, 1904; at one time president of the Bank of Madrid; in 1954 was awarded a certificate of merit by the Medical Association of the State of Alabama in recognition of 50 years service as a practicing physician; died Oct. 15, aged 83.

Bailey, Hugh Alvin Ⓜ Charleston, W. Va.; born in Vass, N. C., Dec. 4, 1900; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1928; specialist certified by the American Board of Surgery; member of the Southern Surgical Association and the Southeastern Surgical Congress; fellow of the American College of Surgeons and co-founder and first president of the West Virginia Chapter; consulting surgeon at Memorial, Kanawha Valley, and Staats hospitals in Charleston, and visiting surgeon at Mountain State, St. Francis, and McMillan hospitals; died in a hospital in Baltimore Oct. 25, aged 57, following an operation for cancer of the lung.

Ballard, Robert Jackson, Michigan City, Ind.; Indiana University School of Medicine, Indianapolis, 1942; on the staffs of St. Anthony Hospital in Michigan City, and the Dr. Norman M. Beatty Memorial Hospital in Westville; died July 9, aged 42, of injuries received when his automobile was struck by a train.

Benson, Harry William, Winter Park, Fla.; University of Nebraska College of Medicine, Omaha, 1903; an associate member of the American Medical Association; for nine years a trustee of the Nebraska State Medical Association and in 1952 the organization gave him a distinguished service medal and made him a member emeritus; member of the American Academy of General Practice and one of the founders and past-president of the Nebraska Section; in 1926 was president of the Oakland, Neb., Chamber of Commerce; died in Orlando Oct. 15, aged 82, of thrombosis.

Blackburn, Elisha, Worthington, Ohio; University of Wooster Medical Department, Cleveland, 1903; served as a medical missionary in Africa; died in the Jeanes Hospital, Philadelphia, Oct. 12, aged 85, of arteriosclerosis.

Blankenship, Marvin Winfred Ⓜ Fulton, Ky.; University of Tennessee College of Medicine, Memphis, 1951; interned at the Baptist Memorial Hospital in Memphis, Tenn.; veteran of World War II; co-owner of the Hillview Hospital; accidentally shot and killed by a deer hunter in Grand Junction, Colo., Oct. 17, aged 34.

Bohannan, Hugh Russell Ⓜ Jerseyville, Ill.; Illinois Medical College, Chicago, 1904; past-president of the Jersey County Medical Society; director of the Jersey Savings & Loan Company with which he was associated for over 39 years; died in St. Joseph's Hospital Oct. 20, aged 82, of a cerebrovascular accident.

Boiarsky, Julius Lewis Ⓜ Charleston, W. Va.; Duke University School of Medicine, Durham, N. C., 1935; interned at the Deaconess Hospital in Cincinnati and served a residency at Charleston General Hospital; veteran of World War II; founder and director of the Boiarsky Memorial Hospital; died Oct. 29, aged 51.

Brockway, Porter Bruce Ⓜ Toledo, Ohio; Rush Medical College, Chicago, 1900; member of the House of Delegates of the American Medical Association in 1911; member of the Academy of Medicine of Toledo and Lucas County and the American Public Health Association; veteran of World War I; founder of the health department in the public schools of Toledo, where he served for 33 years as director of health; chief of staff and board member of the Flower Hospital; associated with Toledo Hospital, St. Charles Hospital, and Maumee Valley Hospital, died Oct. 28, aged 83, of coronary insufficiency.

Butterfield, Clarence Egbert Ⓜ Concord, N. H.; Dartmouth Medical School, Hanover, N. H., 1903; on the emeritus staff, Concord Hospital, where he died Oct. 16, aged 82, of coronary thrombosis.

Clark, Harold Chandler, New Rochelle, N. Y.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1918;

Ⓜ Indicates Member of the American Medical Association.

member of the Medical Society of the State of New York and the American Academy of Pediatrics; associated with the New Rochelle Hospital, where he died Oct. 22, aged 65.

Clifton, Willie Mae, Northfield, Ill.; Woman's Medical College of Pennsylvania, Philadelphia, 1932; specialist certified by the American Board of Pediatrics; interned at the Bethesda Hospital in Cincinnati; served a residency at the Children's Memorial Hospital in Chicago, where she was on the attending staff; died in the Evanston (Ill.) Hospital Sept. 27, aged 52, of heart failure due to mitral insufficiency.

Coburn, Henry Clay Jr. ® Brigadier General, U. S. Army, retired, Haddonfield, N. J.; born in Washington, D. C., Aug. 5, 1879; Columbian University Medical Department, Washington, D. C., 1903; entered the medical corps of the U. S. Army in 1909 and saw service in the Philippines and North China from 1910 to 1913; served in France during World War I; chief of medical service at Walter Reed General Hospital, Washington, D. C., from 1935 to 1939, before which he had held similar posts at Fitzsimons General Hospital, Denver, and the U. S. Army Hospital at Fort Sam Houston, Texas; his last active duty assignment before retiring in 1946 was as surgeon at Fort Bragg, N. C.; retired Aug. 31, 1943; retained on active duty until Jan. 20, 1946; held the Legion of Merit and the French Legion of Honor; specialist certified by the American Board of Internal Medicine; service member of the American Medical Association; fellow of the American College of Surgeons and the American College of Physicians; died Oct. 22, aged 79, of coronary thrombosis and arteriosclerosis.

Cochran, Athol ® Joplin, Mo.; Memphis (Tenn.) Hospital Medical College, 1901; member of the Kansas Medical Society; also a minister; formerly practiced in Pratt, Kan., where he was associated with the Ninnescab Hospital; died in the Barton County Memorial Hospital, Lamar, Oct. 19, aged 81, of injuries received in an automobile accident.

Cooley, Ben Hunter ® El Paso, Texas; University of Oklahoma School of Medicine, Oklahoma City, 1921; veteran of World Wars I and II; fellow of the American College of Physicians; past-vice-president of the Texas Heart Association; associated with the Southwestern General and Providence Memorial hospitals and the Hotel Dieu, Sisters' Hospital; died Sept. 20, aged 63.

Cuff, John Reginald, Nashville, Tenn.; Meharry Medical College, Nashville, Tenn., 1926; professor of pathology at his alma mater; certified by the National Board of Medical Examiners; specialist certified by the American Board of Pathology; died in the Hubbard Hospital Oct. 22, aged 64, of cancer of the stomach.

Elkin, Daniel Collier, Lancaster, Ky.; born in Louisville March 26, 1893; Emory University School of Medicine, Atlanta, 1920; served an internship and residency at the Peter Bent Brigham Hospital in Boston, where he became an assistant in surgery at Harvard Medical School; professor emeritus of surgery at his alma mater, where he joined the faculty as instructor of surgery in 1923, subsequently serving as associate in surgery and for 23 years professor and chairman of the department of surgery; in 1939, when it was established, became Joseph Brown Whitehead professor of surgery; visiting professor at the University of Virginia School of Medicine in Charlottesville, University of Michigan Medical School, Ann Arbor, and Harvard Medical School in Boston; chairman, Section on Surgery, General and Abdominal, American Medical Association, from 1944 to 1946; past-president of the American College of Surgeons (of which he was a regent), the Society of Vascular Surgery, Society of Medical Consultants, Southern Surgical Association, American Surgical Association, of which he was past-vice-president, and the Society of Clinical Surgery; member of the International Society of Surgeons, and senior member of the American Association for Thoracic Surgery; member of the founders group of the American Board of Surgery; specialist certified by the Board of Thoracic Surgery; during World War II spent more than three years as chief of the surgical section and chief of professional services at Ashford General Hospital, White Sulphur Springs, W. Va.; released from active duty as a colonel in 1946 and in 1949 was promoted to brigadier general in the reserve; later consultant in surgery to the surgeon general, chief civilian consultant in surgery for the Third Army, and consultant to the Walter Reed Army Medical Center, Washington, D. C.; in 1945 was awarded the Legion of Merit for his Army service in which he "developed and standardized methods of diagnosis and introduced new and improved techniques in surgical procedure on wounds of the blood vessels"; in 1940 he became the third man to be awarded the Matas Medal by Tulane University for "conspicuous achievements in advancing the progress of vascular surgery"; in 1954, at the 104th annual meeting of the Medical Association of Georgia in Macon, received the Lamartine Griffin Hardman award for "distinguished service to the science of medicine and the medical profession in Georgia" and for "exceptional work in the field of vascular surgery"; from 1939 to 1948 surgeon-in-chief of the Grady Memorial Hospital; served as surgeon in chief of the Henrietta Egleston Hospital for Children; member of the founders group of the American Board of Surgery; specialist certified by the Board of Thoracic Surgery; special consultant to the U. S. Public Health Service (National Institutes of Health) and chairman of the subcommittee on vascular surgery of the National Research Council; a member of the committee on medical affairs of Yale University in New Haven, Conn., and a trustee of the University of Kentucky, Lexington; held an honorary doctor of science degree from Northwestern University in Chicago; author of many papers on surgical subjects; died Nov. 3, aged 65, of heart disease.

Grube, Orin Charles, Minneapolis; State University of Iowa College of Medicine, Iowa City, 1957; interned at Broadlawns Polk County Hospital in Des Moines; died in the University Hospitals, Iowa City, Sept. 19, aged 26.

Herbst, Richard Fred Ⓜ Willmar, Minn.; University of Minnesota Medical School, Minneapolis, 1933; on the staffs of the Willmar State Hospital and the Rice Memorial Hospital, where he died Oct. 5, aged 50, of electrolytic imbalance.

Hindman, Sims Seward, Waynesville, N. C.; Vanderbilt University School of Medicine, Nashville, Tenn., 1900; veteran of the Spanish-American War; for many years practiced in Toledo, Ohio, where he was on the staff of the Riverside Hospital; on the staff of the Haywood Hospital; died in the Wyandotte (Mich.) General Hospital Oct. 6, aged 79, of cerebrovascular accident.

Jackson, Isaiah Allen, Richmond, Va.; Leonard Medical School, Medical Department of Shaw University, Raleigh, N. C., 1911; served on the staff of the Richmond Community Hospital, of which he was one of the founders; on the courtesy staff of Richmond Memorial Hospital; died Oct. 28, aged 70.

Jacobson, Arthur Clarence, Brooklyn; born in Brooklyn Sept. 28, 1872; Long Island College Hospital, Brooklyn, 1894; an associate member of the American Medical Association; member of the American Academy of General Practice, American Association for the Advancement of Science, Medical Library Association, Associated Physicians of Long Island, Alumni Association of Brooklyn Hospital and Long Island College Hospital; medical inspector of city schools, department of health, New York City, 1899; physician, department of public welfare, New York City, from 1900 to 1929; physician, department of hospitals, New York City, from 1929 to 1945; author of "Genius–Some Revaluations," published in 1926; in 1927 became editor of the *Medical Times,* serving until he was named editor-in-chief emeritus last January; died in the Brooklyn Hospital Oct. 15, aged 86, of uremia, secondary to arteriosclerotic cardiovascular disease and diverticulitis with abscess and hemorrhage.

Joseph, Cheney Cleveland Ⓜ Baton Rouge, La.; Tulane University School of Medicine, New Orleans, 1938; specialist certified by the American Board of Internal Medicine; member of the American College of Chest Physicians; medical director of the United Security Life Insurance Company; veteran of World War II; on the staffs of Our Lady of the Lake Hospital and the Baton Rouge General Hospital, where he died Oct. 13, aged 44, of an accidental gunshot wound of the brain.

Keating, Robert Alfred Ⓜ Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1937; assistant professor of surgery at his alma mater; fellow of the American College of Surgeons; member of the Columbus Academy of Medicine; veteran of World War II; associated with University, Mount Carmel, Children's, and White Cross hospitals; died in Milwaukee, where he was attending a medical meeting Oct. 7, aged 47, of coronary occlusion.

Kennedy, J. Edward T., Cincinnati; Ohio-Miami Medical College of the University of Cincinnati, 1913; veteran of World War I and was awarded the Belgian Croix de Guerre by the king; for many years police and fire surgeon; formerly associated with the U. S. Public Health Service; served as vice-president of the Good Samaritan Hospital and chief of the medical staff, Deaconess Hospital; rating specialist for the Veterans Administration Hospital; died in the Veterans Administration Hospital Oct. 1, aged 72, of a heart attack.

Manwaring, Ier Jay Ⓜ Norwich, Conn.; Woman's Medical College of Pennsylvania, Philadelphia, 1895; during World War I, as a member of the American Women's Hospital unit number 1, was attached to a division of the French Army and served in France for 14 months; in April, 1919, was decorated by the French government for service at Chateau Thierry and Belleau Wood; died in the William W. Backus Hospital Oct. 3, aged 85.

Martin, Charles Dyer, Davenport, Iowa; Marquette University School of Medicine, Milwaukee, 1917; veteran of World War I; found dead in a hotel room at Chattanooga, Tenn., Oct. 13, aged 65, of heart disease.

Sands, Irving Jesse Ⓜ Brooklyn; born in Russia March 27, 1891; Columbia University College of Physicians and Surgeons, New York City, 1913; served on the faculty of his alma mater; specialist certified by the American Board of Psychiatry and Neurology; fellow of the American College of Physicians, New York Academy of Medicine, and the American Psychiatric Association; member of the American Neurological Association, American Psychoanalytic Association, American Academy of Neurology, American Psychosomatic Society, American Geriatrics Society, and the Association for Research in Nervous and Mental Disease; past-president of the New York Neurological Society; panel psychiatrist for the board of education and honorary police surgeon; consultant for the New York State Workmen's Compensation board; author of "Abnormal Behavior" and "Neuropsychiatry for Nurses"; on the associate editorial board, *New York State Journal of Medicine;* consultant at Veterans Administration; associated with the Rockaway Beach and St. Joseph hospitals in Far Rockaway, Hillside Hospital in Bellerose, New York Neurological Institute of the Columbia-Presbyterian Medical Center in New York City, Adelphi, Brooklyn State, Prospect Heights, Women's, Kingston Avenue, Coney Island, Beth El, and Jewish Chronic Disease hospitals, and the Jewish Hospital, where he was head of the medical board and where he died Oct. 21, aged 67, of myocardial infarction.

Sawyer, Matthias Harvey Ⓜ Ottawa, Ill.; Sioux City (Iowa) College of Medicine, 1904; past-president of the La Salle County Medical Society; at one time health officer of Ottawa; county coroner from 1950 to 1952; on the honorary staff of Ryburn Memorial Hospital, where he died Oct. 13, aged 79, of bronchopneumonia.

Scott, Edwin Laurence, Ocala, Fla.; University of Maryland School of Medicine, Baltimore, 1906; member of the American Orthopaedic Association; formerly practiced in Birmingham, Ala., where he was one of the founders of the Crippled Children's Clinic; recently honored with a citation from the Florida Association of Insurance Agents; died Oct. 10, aged 74, of cancer.

Shaw, Henry Alden Ⓜ Colonel, U. S. Army, retired, Rutland, Mass.; born in New Salem, Mass., June 3, 1867; Harvard Medical School, Boston, 1890; service member of the American Medical Association; fellow of the American College of Surgeons; served an internship at the Massachusetts General Hospital in Boston, then entered the U. S. Army Medical Corps in which he served for thirty years' service before retiring in 1921; decorated with the Distinguished Service Medal; officier, Legion of Honor, France; veteran of World War I; assistant in bacteriology, University of Minnesota Medical School, Minneapolis, 1896-1897; assistant in surgery, Army Medical School, Washington, D. C., 1902-1903; professor of military hygiene, U. S. Military Academy, West Point, N. Y., from 1914 to 1917; sanitary advisor, League of Red Cross Societies Commission to Poland, Warsaw, 1920-1921; in charge of the hospital division of the Veterans Bureau in Washington, D. C., in 1921; psychiatrist and assistant professor of mental hygiene at his alma mater from 1925 to 1934; the following year became psychiatrist in the outpatient department at the New York Hospital; died in the Holden District Hospital, Haydenville, Oct. 19, aged 91.

Shumway, John Raymond, Pleasanton, Kan.; University Medical College of Kansas City, Mo., 1901; served as health officer and coroner of Linn County; on the staff of Mercy Hospital in Fort Scott; died Oct. 1, aged 80, of cerebral hemorrhage.

Southard, Jefferson Sherlock, Fort Smith, Ark.; Tulane University of Louisiana School of Medicine, New Orleans, 1922; veteran of World War I; past-president of the Sebastian County Medical Society; died in Little Rock Oct. 8, aged 63.

Speight, James Ambler, Rocky Mount, N. C.; Tulane University of Louisiana School of Medicine, New Orleans, 1914; member of the Medical Society of the State of North Carolina; formerly county health officer; for services rendered in World War II was awarded a Selective Service Medal; Speight-Stone Clinic is now known as the Memorial Hospital; associated with Park View Hospital; died Oct. 1, aged 68, of heart disease and cirrhosis of the liver.

Stapleton, Harvey Burr Ⓜ Hickman, Neb.; Creighton University School of Medicine, Omaha, 1917; veteran of World War I; member of the American Academy of General Practice; died in Lincoln Oct. 1, aged 68, of coronary thrombosis.

Strode, George King, Whitingham, Vt.; born in Chadds Ford, Pa., Jan. 16, 1886; University of Pennsylvania School of Medicine, Philadelphia, 1912; received master's degree in public health at Harvard in 1927; served as hygienist of the Pennsylvania State Department of Health in Harrisburg; member of the International Health Division of the Rockefeller Foundation since 1920, having been chosen a member for one year in 1916; served as director from 1944 until his retirement in 1951; stationed in Brazil for the division from 1920 to 1926; assistant director from 1927 to 1938 in charge of the division's activities in Europe, Africa, and the Near East, with headquarters in Paris; chairman of the foundation's Paris office from 1932 to 1938, when he became associate director; captain in the medical corps of the U. S. Army, serving in France during World War I; member of the American Red Cross missions during World War II, to Russia in 1941, Iceland in 1942, and North Africa in 1942-1943; during the war was also a member of the advisory council of the division of health and sanitation, of the Institute of Inter-American Affairs, of the subcommittee on tropical diseases on the National Research Council, and of the subcommittee on tropical diseases of the health advisory committee, Office of Foreign and Rehabilitation Operations; an honorary fellow of the Society of Medical Officers of Health of Great Britain; fellow of the American Public Health Association; a member of the American Society of Tropical Medicine, American Academy of Tropical Medicine, of which he was past-vice-president, American Association for the Advancement of Science, and the New York Society of Tropical Medicine; decorated by the governments of Norway, Denmark, Bulgaria, Portugal, France, Rumania, and Sweden; editor of "Yellow Fever," published in 1951; "The Story of the Rockefeller Foundation" by Raymond B. Fosdick published in 1952 praised his work; died in the Brattleboro (Vt.) Memorial Hospital Oct. 27, aged 72, of adenocarcinoma of bladder with metastases.

Sturkey, Edgar Lafayette, Augusta, Ga.; University of Georgia Medical Department, Augusta, 1906; served on the staffs of various Veterans Administration hospitals; died in the Veterans Administration Hospital Oct. 9, aged 76.

Sullivan, Thomas Henry Ⓢ Fall River, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1930; member of the American Academy of General Practice; associate medical examiner for the greater Fall River area; during World War II served as assistant regimental surgeon with the rank of captain in the medical corps of the Second Armored Division; participated in the African campaign and the invasion of Normandy; decorated by the governments of Belgium and the Netherlands and held a presidential citation; died Oct. 12, aged 56.

Sunderland, Paul Ulysses Ⓢ Danbury, Conn.; New York Homeopathic Medical College and Flower Hospital, New York City, 1894; on April 30, 1957, the Connecticut State Medical Society honored him with a 50-year membership citation; on the staff of the Danbury Hospital; died Oct. 9, aged 89, of arteriosclerotic heart disease.

Swartsel, Samuel Carey, San Diego, Calif.; Medical College of Ohio, Cincinnati, 1897; recipient of distinguished service award from the American Cancer Society in 1951; at one time practiced in Cincinnati, where he was past-president of the Cincinnati Medical Society; died Oct. 10, aged 90.

Taylor, Richard Francis, Philadelphia; Jefferson Medical College of Philadelphia, 1905; affiliated with Jefferson and Lankenau hospitals; at one time police surgeon; served on the draft board during World War I; died Oct. 25, aged 79, of heart disease.

Terry, Ernest Alden Jr. Ⓢ Louisville, Ky.; Columbia University College of Physicians and Surgeons, New York City, 1945; certified by the National Board of Medical Examiners; member of the American Academy of Occupational Medicine and the Industrial Medical Association, of which he was counselor; assistant professor of community health, University of Louisville School of Medicine; served in the U. S. Naval Reserve from April, 1946, to April, 1948, and again from September, 1950, to March, 1951; medical director of the General Electric Appliance Park Plant; aged 38; was shot and killed Oct. 26, by a former company employee.

Thomas, Napoleon Roscoe Ⓢ Albany, Ga.; Atlanta School of Medicine, 1913; veteran of World War I; served as chief of obstetrics and chief of staff at the Phoebe Putney Memorial Hospital; died Oct. 2, aged 76, of cerebral thrombosis and arteriosclerosis.

Thompson, Joseph Ignatius A., Margate City, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1904; died Oct. 12, aged 75.

Tucker, Adam Reynold, Raleigh, N. C.; Southern College of Medicine and Surgery, Atlanta, 1912; a founder of the Mary Elizabeth Hospital; died Oct. 19, aged 80, of pneumonia.

Tucker, Augustine Washington, Charlottesville, Va.; born in 1883; University of Virginia Department of Medicine, Charlottesville, 1905; fellow of the American College of Surgeons; professor of surgery at St. John's University in Shanghai, China, where he was associated with St. Luke's Hospital; for many years medical missionary of the Protestant Episcopal Church to China; during World War I served in Siberia with the American Red Cross; at one time superintendent of St. Agnes Hospital in Raleigh, N. C.; from 1950 to 1954 school physician at Woodberry Forest; died in the Blue Ridge Sanatorium Oct. 4, aged 75, of pulmonary tuberculosis.

Warren, Alexander M., Rose City, Mich.; Saginaw (Mich.) Valley Medical College, 1902; died Oct. 6, aged 84, of carcinomatosis.

Watkins, Leon Harlan, Pasadena, Calif.; Johns Hopkins University School of Medicine, Baltimore, 1909; an associate member of the American Medical Association; died Oct. 9, aged 75, of uremia and nephritis.

Watts, Charles Edward Ⓢ Seattle; born in 1889; Rush Medical College, Chicago, 1918; clinical professor of medicine at University of Washington School of Medicine; past-president of the Washington State Medical Association, King County Medical Society, North Pacific Society of Internal Medicine, and the Pacific Inter-Urban Clinical Club; first president of the Washington State Health Council; active in the Washington State Heart Association and served as vice-president of the American Heart Association; fellow of the American College of Physicians, serving on the board of governors from 1935 to 1947 and as vice-president in 1948-1949; during World War II served in the medical corps of the U. S. Naval Reserve; for many years consultant at the U. S. Public Health Service Hospital and the Veterans Administration Hospital; served as chief of medical services at Harborview Hospital; on the staffs of the Maynard Hospital and the Swedish Hospital, where he died Oct. 12, aged 68, of cerebral thrombosis, cerebral arteriosclerosis, and hypertension.

Wiatt, William Slaughter Ⓢ La Jolla, Calif.; Hospital College of Medicine, Louisville, 1897; member of the Missouri State Medical Association; fellow of the American College of Surgeons; served on the faculty of St. Louis University School of Medicine; formerly practiced in St. Louis, where he served on the staff of the Missouri Baptist Hospital; died Oct. 14, aged 86, of cancer of the bladder.

FOREIGN LETTERS

BELGIUM

Iturine.—Delcombe and Devignat (*Annales de la société des sciences médicales*) studied a strain of spore-forming aerobic bacillus which produces in various culture mediums an antibiotic designated as iturine. The bacillus presented all the characteristics of Bacillus subtilis. Two types of colonies isolated differed in their ability to elaborate iturine. The crude products of the cultures could be separated into three fractions. Two of these (O and N) were soluble in acetone, and the third fraction (L) was not. These three fractions were readily differentiated by their antibiotic spectrum, thermostability, and resistance to ultraviolet rays, by paper chromatography, and by dialysis. It is fraction L which has been named iturine. No allergic reaction to this antibiotic has been noted. Clinical tests showed it to be more active than other antifungal agents. About 70% total cures were reported in patients with cutaneous mycoses, with few relapses. Such refractory diseases as epidermophytosis palmaris et plantaris and herpes circinatus have yielded to the drug.

The Postoperative Hiccup.—The postoperative hiccup may appear in different circumstances, and its treatment requires special attention. Reinhold (*Acta anæsthesiologica belgica*) pointed out the harmlessness of the preoperative hiccup, which he treats by aiding respiration. Since the postoperative hiccup is much more alarming, treatment by the inhalation of carbon dioxide infiltration of the phrenic nerve, chlorpromazine, or methamphetamine is recommended. Methamphetamine does not act on the sympathetic nervous system, but rather stimulates the central nervous system. For this reason the author gave 20 mg. of methylphenidate to 12 patients with postoperative hiccup with excellent results in all. The drug was given either intravenously or intramuscularly and no unfavorable side-effects were noted. The action of methylphenidate thus indicates a central origin of hiccups. This drug was especially helpful in old and weak patients in whom chlorpromazine and methamphetamine might cause unfavorable circulatory effects.

Ocular Senescence.—At the 18th International Congress of Ophthalmology in Brussels, Dr. François stated that it was impossible to determine at what age the eye should be considered as being old. Growing old consists of a progressive alteration of the tissular structure, changes that are usually found in the eyes of older persons are considered physiological but those that are found only rarely, although exclusively in the eyes of the aged, are considered pathological. The general senile changes seen in the eye include arteriosclerosis, proliferation of certain tissues, fatty or calcareous infiltration, increase in collagenous tissue, and hyaline degeneration. The degree of these changes varies greatly from one subject to the other and gives no clue to the age of the subject. The sclerotic eye becomes more rigid, and can present a fatty, as well as a calcareous, infiltration. Aging of the lens is associated with a series of changes in its composition, most of which start early in life. In the first years of life, particularly, the concentration of the organic elements become modified, whereas at a more advanced age it is the concentration of the organic substances that changes. Among these latter studies attention was particularly directed toward proteins, which constitute the fundamental substance of the lens fibers.

CANADA

Legal Validity of Breath Tests.—The Supreme Court recently upheld, by a five to three decision, the Saskatchewan provincial legislation compelling suspected drunken drivers to undergo a breath test or face suspension of their driving permit. Mr. Justice Fauteux said that, since a license holder in this condition is in a position similar to that of a person suspected of physical or mental affliction likely to prevent reasonable care and ordinary control of a vehicle, he could be required to submit to an appropriate examination. The refusal to submit to a breath test cannot however be mentioned in court during a charge of drunken or impaired driving, nor can it be made legally compulsory. The main objection to the requirement had been that it conflicted with the criminal code. The three judges in the minority all believed that this was true of the regulation, while the others held that it was not criminal legislation but only a statute relating to the administration and control of the highways.

Experimental Atherosclerosis.—A collaboration between veterinarians and clinicians was described in the *Canadian Medical Association Journal* by Rowsell and co-workers (79:647, 1958). Recent

---

The items in these letters are contributed by regular correspondents in the various foreign countries.

work suggested that patients with clinical manifestations of atherosclerosis have abnormally active clotting systems. This activity is determined to some extent by the type of fat in the diet. Because butter accelerates clotting in vitro and in vivo, and margarine has little such activity, feeding animals butter could be expected to produce more atherosclerosis than could feeding them margarine. At the Ontario Veterinary College, 33 hogs were divided into three groups and fed a low-fat diet and a diet rich in butter or in margarine respectively. Some atherosclerosis was found in the swine fed a low-fat diet, and this was not greatly increased by adding margarine, but the group fed butter had a marked increase in amount of atherosclerosis. Coagulation indexes at the end of the experiment were most active in the butter-fed swine with the most atherosclerosis. Grossly and microscopically, the atheromas in the swine resembled human lesions.

A further study of coagulation indexes in human subjects by Mustard (*Canad. M. A. J.* 79:736, 1958) produced further evidence linking atherosclerosis with blood coagulation. In this experiment, 135 men were divided into groups of those with clinical complications of atherosclerosis or a family history of the disease and those with no family history and no clinical signs. They were all given a meal of dairy fat and eggs. The atherosclerotic subjects had the greatest mean increase in plasma density and Christmas factor activity, and decrease in antihemophilic globulin activity. The control group had the least changes. It seems that subjects with clinical signs or a family history of atherosclerosis have a more greatly enhanced clotting activity during alimentary lipemia than those with a negative history and no signs.

Alcoholism.—The seminar of the Alcoholism Research Foundation of Ontario included physicians, psychologists, educators, sociologists, psychiatrists, editors, and public relations personnel. It examined the problem of alcoholism almost de novo, asking what the fundamental obstacles were to further understanding of this problem. One of the problems considered was that of setting a threshold above which the regular use of alcohol might be expected to cause harm, either by producing physical or mental impairment or by causing addiction. A forensic expert pointed out the gross discrepancy between the high legal limits for drunkenness (for example, in automobile driving) and the educational limits tacitly admitted in such phrases as "if you drink, don't drive." When the question of substitute addictions for alcohol was discussed, it was doubted whether pharmacologists would ever succeed in producing a harmless drug which could replace alcohol by producing that feeling of self-transcendance some persons apparently need. There appeared to be a number of routes to alcoholism—one person might seek a mystical experience, another a relief from isolation (our herd-approval-seeking society was blamed for much of this), a third oblivion from guilt feelings. The leader of the seminar pointed out that whereas nobody thought that a little tuberculosis or venereal disease was good for one, folklore said that small amounts of alcohol were good for health. Hence the difficulty of getting the public to cooperate in public health campaigns or even to accept the results of research, if the latter conflict with the folklore.

Tissue Culture of Leishmania Donovani.—The School of Hygiene of the University of Toronto may appear a peculiar place to develop a new method of tissue culture of a tropical parasite. The anomaly is explained by the great interest of this school in tissue culture techniques. Leishmania donovani, the cause of visceral leishmaniasis, has proved difficult to grow on tissue cultures for diagnostic work, but Belle (*Canad. M. A. J.* 79:726, 1958) succeeded by using human epithelial cells from amnion trypsinized to liberate the epithelium, grown on nutrient medium, inoculated with cultures of L. donovani grown on Tobie's medium, and incubated. The parasites began to multiply within 48 hours, and continued to grow in culture even after five serial transfers. The author found that the elongated leptomonads multiplied by longitudinal fission, and some became pear-shaped and aflagellate, subsequently undergoing change to ovoid Leishman bodies.

Fluoridation of Water.—Physicians sometimes lose good causes because they will not stand up and fight. Dr. Sturgeon, health officer to an Ontario district (*Canad. J. Pub. Health* 49:425, 1958), told how physicians joined with dentists to obtain the favorable result of a plebiscite taken in the little town of Thorold to determine whether the town should continue to fluoridate its water supply. Led by the local chiropractor, a so-called citizens' committee, composed mainly of out-of-town members and a few religious cranks, had begun an intensive canvass to abolish fluoridation, when the local health forces stepped into the field with a door-to-door canvass by all available nurses, paid advertisements in local papers, public addresses, a total telephone canvass, and talks to students. The vote in favor of fluoridation was 1,359 to 756, and the most important single contribution to success is said to have been the widely distributed letter signed by all the physicians and dentists in the area. Persons with no convictions about the matter often said that the advice of their physician or dentist had outweighed for them the arguments of the opposition. Moreover the widely publicized statement of the American Medical Association on fluoridation did much to counteract the pseudoscientific material put out by the opposition. Special credit should go to one physican who persuaded all his colleagues to put their signatures to the letter which made up the minds of the waverers.

American Academy of Neurological Surgery.—At the meeting of the American Academy of Neurological Surgery in Toronto, in November, T. P. Morley of Toronto said that most cerebral tumor tissue was inherently capable of easier growth than normal adult tissue in culture, but the speed of growth was not related to the degree of anaplasia, and occasionally normal tissue proliferated just as well as the tumor cells. W. J. Horsey of Toronto had inflicted posterior hypothalamic lesions on cats, and used protein-bound iodine (PBI) levels to study thyroid activity afterwards. The PBI levels rose in some cases, though no endocrine changes were seen at autopsy. Presumably there was a disorder of thyroid-stimulating hormone (TSH) secretion. C. Ezrin of Toronto described evidence that there were four normal anterior pituitary cell types, with different staining properties on iron-PAS staining. The alpha, orange-staining cell seemed related to growth hormone and prolactin secretion. The beta, dark-red-staining cell was probably related to a storage form of ACTH and TSH, while the delta cell, staining deep blue, was related to the storage form of luteinizing hormone (LH) and follicle-stimulating hormone (FSH). There was a rather doubtful gamma cell which might contain actively secretory forms of ACTH, TSH, FSH, and LH. In prolonged illness, the delta cells became scarcer in association with a failure of gonadotropic function.

J. W. Scott of Toronto had studied the question of ureteral reflux in dogs, recording bladder and ureteral pressures during increasing bladder distention per urethram. At about 90 mm. Hg pressure in the bladder, urine secretion stopped. At lower levels, intraureteral pressures rose parallel to intravesical pressure, but reflux did not occur. The inference is that in paraplegics it is important to prevent high intravesical pressures from developing. C. G. Drake of London, Ontario, had repaired the facial nerve in three patients by using a graft from the lateral femoral cutaneous nerve of the thigh carried through the posterior fossa. Some return of facial function had occurred. W. M. Lougheed of Toronto had devised a method of introducing blood into the subarachnoid space of dogs through a catheter inserted via a bur hole in the roof of the nose, and was surprised to find that symptoms developed in only 3 of 10 dogs so injected.

S. Birse of Toronto had examined the brains of 19 patients who died after rupture of a berry aneurysm in the anterior cerebral-anterior communicating area. The outstanding finding was that of extensive areas of cerebral softening often detectable only on histological examination, and not at all related to the extent of the subarachnoid hematoma. C. Bertrand of Montreal demonstrated his apparatus for producing needle electrode lesions in the globus pallidus. Lesions 12 mm. in diameter gave durable results as regards reduction of rigidity and tremor in patients with paralysis agitans. To be effective in choreoathetosis, the lesion must be carried further back and involve the corticospinal tract. Murray Falconer of London, England, drew attention to the common association of temporal lobe epilepsy with small focal lesions not detectable even at operation. He had collected 23 cases in which the pathologist had later demonstrated 13 tumors, 2 vascular malformations, 5 cortical scars, and 2 cortical infarcts. Operation had given good results in 21 patients, with complete cure in 14.

INDIA

Determination of Body Fat.—Sen and Banerjee (*Indian Journal of Medical Research*, vol. 46, July, 1958) determined the body fat of 16 men and 9 women by using different methods and compared the results. In the first method, body fat was calculated from the specific gravity of the body determined by the water displacement method according to the formula of Rathbun and Pace. In the second method it was calculated from the density of the body using the formula of Keys and Brozek. The skin fold measurements were taken at different sites by means of calipers over the abdomen, chest, back, and right arm. A high degree of correlation existed between the specific gravity of the body as measured and that calculated from the different skinfold measurements. Thus the skinfold measurements may be used advantageously in place of measurement of the specific gravity of the body by the cumbersome water displacement method. The average fat content of the body calculated from the specific gravity of the body using the first method was 11% of the body weight, while the reading obtained by the second method was 11.3%.

Vaginal Cytology and Uterine Bleeding.—S. J. Kripalani (*Journal of the Association of Medical Women in India*, vol. 46, August, 1958) stated that an abnormality in secretion of hormones is responsible for dysfunctional uterine bleeding. Changes in vaginal smears can indicate the lack or excess of ovarian endocrine functions and the effect of therapeutic hormones. These smears are also helpful in distinguishing dysfunctional bleeding from other causes of uterine bleeding such as abortion or malignancy. The vaginal smears for this purpose should be studied every third or fourth day during the menstrual cycle. The author thus studied 30 women with a clinical diagnosis of functional bleeding. The age of these patients varied from 16 to 45 years; 25 were married, 2 were widows, and 3 were single. Of the married women 11 were nulliparous. The duration of the disease was on an average 2.4 years. Thirteen had prolonged menstrual periods after periods of amenorrhea; 10 had prolonged periods at short intervals of 6 to 18 days; 5 had excessive bleeding at regular intervals of 26 to 30 days; and 2 had almost continuous bleeding with occasional and irregular cessation. Fourteen patients were studied for three or four cycles regularly and showed two main types of curves, 4 showing hyperestrogenic and 10 showing hypoestrogenic curves. Thus the output of estrogen was lower than normal in 10 of these 14 patients with bleeding. In 5 of the 10 patients with hypoestrogenic curves, endometrial biopsy specimens revealed endometrial proliferation with dilated glands in 2, endometrial proliferation without dilated glands in 1, mixed endometrium indicating irregular ripening in 1, and early secretory changes after the patient had been treated with progesterone in 1. A nonhyperplastic proliferative endometrium or a poorly developed secretory phase indicates subnormal ovarian activity and thus the findings of endometrial biopsy specimens and vaginal smears corresponded in these patients.

From the point of view of treatment, patients with functional uterine bleeding were divided into those with hyperestrogenic and those with hypoestrogenic curves. In two patients with hyperestrogenic curves treated with estrogens, bleeding stopped temporarily with recurrence of irregular bleeding, while the cornification percentage showed a further rise but the clinical symptoms persisted. One patient with a hyperestrogenic curve was treated with progesterone but the intensity of bleeding increased and the treatment was stopped. Two patients with the same type of curve were treated with testosterone during the bleeding phase. Good results were seen in both and normal flow at regular intervals was seen during the next three or four cycles. Vaginal smears in the following cycles indicated anovulatory cycles. Two patients with hypoestrogenic curves responded well to treatment with estrogens. Results with progesterone in this type of curve were unsatisfactory. One patient with hypoestrogenic curve was treated with testosterone. An immediate hemostatic effect was produced but the delayed effect was a prolongation of the intermenstrual periods to 40 or more days. The next two menstrual periods were anovulatory and there was hardly any difference in the cornification percentage. Testosterone should thus not be given to patients with hypoestrogenic curves.

Experimental Cataract.—K. Bagchi (*Journal of the Indian Medical Association*, vol. 31, Oct. 1, 1958) stated that the incidence of senile cataract was much higher and its age of onset much lower in countries where protein malnutrition was prevalent. The high incidence and early age of occurrence in India has been explained as possibly due to the effect of sunlight or ultraviolet irradiation. Probably protein malnutrition, which is also widely prevalent here, causes early lens changes. A further insult then in the form of ultraviolet light may precipitate the development of a clinical cataract. To investigate the effect of general protein malnutrition on the lens, the author fed young pigs diets containing 4.5, 6.5, and 10% of protein. Their body weights were recorded and their lenses examined for sulfydryl and glutathione which are decreased in all forms of cataract and precataract conditions. The lens was also examined histologically. The growth rate in all the three groups of animals was found to be much lower than that of control animals that were given a 20% protein diet. The pigs on the lowest protein level showed no increase in body weight. A mature cataract was seen in these animals after about three months. The glutathione and protein-bound sulfydryl contents of the lens (calculated by noting the difference between the total sulfydryl and the glutathione content) were lower as compared to normal. As a result of this reduction, probably the enzymatic activity in the lens is reduced affecting the essential metabolism and leading to lenticular damage.

The biochemical and histological features of these cataractous lenses closely resembled those seen in rat lenses made cataractous by making them deficient in methionine. The pathogenesis of the protein deficiency cataract in pigs may therefore be similar. Thus, although evidence of production of cataract due to protein malnutrition was obtained, no mention of its development in human beings suffering from protein malnutrition has appeared so far in literature. Probably in countries such as India, where protein malnutrition is widespread and cataracts appear at an early age, biochemical changes are produced in the lens in the growing phase as a result of protein deficiency which are not diagnosed by ordinary ophthalmologic examination but may be detected by examination with a slit-lamp microscope. These damaged lenses then develop cataract when further subjected to such factors as ultraviolet light or deficiency of methionine.

Meprobamate and Mental Disease.—Satya and Bhaskaran (*Journal of the Indian Medical Association*, vol. 31, Oct. 1, 1958) treated 27 patients who had various mental disorders with meprobamate given orally, each tablet containing 400 mg. The conditions for which these patients were treated were schizophrenia, catatonic excitement, mania, behavior disorders, anxiety states, alcoholism, and premenstrual tension. The ages of the patients were 19 to 49 years. They were studied for 10 months. Treatment was started with an initial dose of one tablet three times a day. This was gradually increased to six or more tablets a day, the duration of treatment varying from 21 to 181 days. The results were assessed by noting the improvement in the mental condition and reports from occupational therapists, nurses, and social workers.

Results were unsatisfactory in the two patients with catatonic excitement although they were quieter. Fifteen patients with chronic schizophrenia were included in the trial, the duration of illness varying from 3 to 17 years. All these patients had previously undergone a full course of insulin shock, electro-shock, and reserpine or chlorpromazine with no significant benefit. Only three of these improved on treatment with meprobamate. The drug led to sedation without sleepiness and more cooperative behavior but the presenting symptoms did not disappear. Of five patients with manic reaction, one improved but the others showed no change. The drug was of no use in one patient with behavior disorder and mental deficiency. Four patients with psychoneuroses showed marked improvement. Six patients with chronic psychoses who had had no treatment for a long time were given 1.2 Gm. of the drug in a single dose to determine its hypnotic effect. One felt drowsy two hours after the drug was given but was still responsive to verbal stimulation, the effect lasting for about six hours. Others did not feel drowsy but looked more relaxed. Six patients were subjected to routine electroencephalography which was repeated three hours after 1.2 Gm. of the drug was given by mouth. Two days later electroencephalograms were again made three hours after the administration of 75 mg. of chlorpromazine by mouth. No change in the routine record was seen in any patient nor did the brain potentials show the patterns of normal sleep.

SWEDEN

Plea for a Poison Control Center.—Four articles in *Svenska läkartidningen* for Oct. 24 draw attention to Sweden's need for a poison control center. To demonstrate this need, an inventory was taken of the various chemical-technical preparations stocked in 10 homes of physicians and druggists. The 230 such preparations listed could be classified in five groups according to their functions and composition. The preparations in the first group, such as turpentine, were straightforward enough insofar as accurate information about them could be obtained in any standard textbook of toxicology; but many of the other preparations had proprietary names giving no clue to their composition, hence their toxicity when children have swallowed them and it is desired to use the appropriate antidote. In such cases the services of a poison control center possessing all the necessary data would be invaluable to the physician. At the Sachsska Children's Hospital in Stockholm, Dr. Allan Alvin analyzed the 1,026 cases treated by gastric lavage in the period 1953 to 1957. Tobacco was responsible for 44% of these cases and drugs for 24%. Next were chemical-technical preparations (23%), poisonous plants (4%), and the indelible pencil (5%). This pencil contains the relatively nontoxic gentian violet. Pending the creation of a poison control center, Alvin would like to see published an illustrated toxicological botanical map to serve as a guide to the physician called on to treat a case of poisoning by some plant.

Alcoholic Psychoses.—Nilsson and Frey (*Svenska läkartidningen,* Oct. 24, 1958) observed 476 men with delirium tremens at various periods between 1946 and 1957, during which time there was a continuous increase in the incidence of such admissions to the Lillehagens Mental Hospital. The removal of certain restrictions on the sale of alcohol in 1955 must be held responsible for much of this rise, the admission rate for such cases being many times higher in 1957 than in 1946. No favorable effects from cortisone or reserpine were observed, but excellent results were obtained with electroplexy treatment of auditory hallucinations that had lasted over a week. Much was achieved with antibiotics in combating the pulmonary complications, the mortality from which was thus appreciably reduced.

Myocardial Infarction.—If we knew what predisposes to myocardial infarction its prevention and treatment could be greatly facilitated. Forssman and Lindegard (*Svenska läkartidningen,* Oct. 24, 1958) studied 66 men who suffered from this disease. They had survived the infarct by at least two months and most of them by a year. None was older than 55 years, and most were between 45 and 55. For each patient a healthy control of the same age and sex was chosen at random. Among the many criteria by means of which patient and healthy control could be compared were leadership in occupation, mortality from arteriosclerosis under the age of 70 among the parents, height and weight measurements, explosive and moody temperaments, serum cholesterol levels, and the excretion of steroids in the urine. With regard to the two last criteria, it was found that both patients and controls could be grouped in subgroups according as the serum cholesterol level and the excretion of steroids in the urine was high or low. On the whole the patients were characterized by a high serum cholesterol level and a low steroid excretion as compared with the controls. Because so many criteria were invoked in this study, it was difficult to evolve any mathematical formula from them, and the prophylactic measures to be advocated on the base of this material were only tentative.

Arthrosis of Knee.—At an orthopedic hospital in Norrköping, Dr. S. Nilsson (*Svenska läkartidningen,* Oct. 31, 1958) has since 1957 injected hydrocortisone acetate or prednisolone acetate into the knee joint of 48 patients suffering from arthrosis deformans of the knee. Their ages ranged from 40 to 82 (average 62) years. Most of them had previously undergone x-ray treatment six months or more earlier usually with some brief subjective improvement. The disease had lasted 1 to 15 (average 4) years. Under strict asepsis the punctures were made from the side through the suprapatellar bursa, any fluid present being aspirated before the injection was made. No relief of pain was effected during or after the injection by injecting a local anesthetic as practiced in about half the patients. Fifteen complained of transient, relatively intense pain for a few hours after the injections which were given according to two different patterns, either with five after-intervals of four days or with three after-intervals of seven days. With only 10 exceptions, improvement was effected, and this was so great that it amounted to complete disappearance of pain in 14. The results were best in the slight and early cases and in such as were associated with hydrops of the knee. The duration of improvement was also longer for the light than for the severe cases. No great difference could be detected between the action of the hydrocortisone and that of the prednisolone. Both helped to correct extensor defects of the knee in conjunction with prescribed exercises.

UNITED KINGDOM

Neoplasms After Irradiation.—The *British Medical Journal* of Oct. 18 contains three articles on thyroid neoplasms after irradiation. The first is by the staffs of the departments of pharmacology and therapeutics, pathology, and surgery, University of Sheffield, and the Sheffield National Center for Radiotherapy. They reported a series of nine patients with thyroid neoplasms. In all of them the thyroid had been exposed several years previously to ionizing radiation. In seven, indisputable histological evidence of carcinoma of the thyroid was present, and in six, infiltration outside the gland or metastases had occurred. In six the thyroid had been incidentally exposed to irradiation in infancy or childhood during the treatment of cutaneous lesions by radium or x-ray. In them the dose to the thyroid varied from 130 to 2,700 r, and the latent period from 5 to 18 years. The carcinoma developed in the part of the thyroid exposed to the greatest irradiation. The seventh patient was irradiated for the treatment of thyrotoxicosis when she was 26 years old and had an anaplastic carcinoma 37 years later. In two patients a nodular enlargement of the thyroid developed after irradiation. Histologically, hyperplastic adenomatous areas and mitotic figures were seen, but in the absence of local invasion and metastases, the histological features alone did not justify a diagnosis of carcinoma. They were regarded as premalignant conditions. The authors concluded that exposure in childhood predisposes to the appearance of thyroid neoplasms. The association after irradiation in adult life is less certain.

In the second article Dr. A. W. Goolden said that there is little evidence to suggest that the adult thyroid is susceptible to radiation cancer. The development of carcinoma of the thyroid in three patients after irradiation of the neck was reported. Two of the patients received irradiation in adult life. It was probable that the tumors in these three patients were induced by radiation, but it would be necessary to carry out a large-scale survey to find out whether irradiation of the thyroid gland in adult life increased the incidence of thyroid cancer.

An editorial on this subject stated that conclusions based on previous experience with thyroid irradiation must refer to external irradiation by x-rays or radium, but, since the latent period for the development of carcinoma after irradiation in adults is probably at least 20 years, no conclusions can yet be based on any series of patients who have received radioactive iodine, since this isotope has been in clinical use for only about 16 years. Theoretically, owing to the wide variation in the radiation dosage from the absorbed isotope sustained by the thyroid cells at different points, it is certain that some cells surviving damage will have been irradiated with a dose which in other tissues would lead to tumor formation. The risk of the late development of carcinoma in children in particular makes it justifiable only in exceptional circumstances to use radioactive iodine even for diagnostic purposes, or to use x-rays or radium in the neighborhood of the thyroid in the treatment of simple conditions such as thymic enlargement, nevi, and keloid scars. In later adult life the risk of carcinoma is probably of less importance, but further study of it is needed.

Nuffield Bounty.—In the first 15 years of its existence the Nuffield Foundation has given away about $24,000,000. Of this, $18,000,000 has been spent in the United Kingdom and $5,600,000 in the Commonwealth. Science and technology have received $5,000,000, medicine $4,200,000, care of old people and research into aging $2,800,000, and social research and education $3,500,000.

Phonocardiography and Electrocardiography of the Fetus.—Fetal heart rate, rhythm, and waveform were studied by phonocardiography and electrocardiography from the surface of the mother's abdomen by Smyth and Farrow (*Brit. M. J.* 2:1005, 1958). For phonocardiography, which is the most suitable method for recording heart rate and rhythm and for estimating the systolic and diastolic time intervals, the microphone is applied to the point on the abdomen where the heart is best heard. It is not unduly affected by extraneous noises but is by the mother's speech or movement, or by borborygmi. The principal uses of phonocardiography are to monitor the fetal heart and to check regularity of rhythm and rate after version, the giving of drugs such as oxytocin, or surgical induction of labor, and during the induction of anesthesia or forceps delivery. It is also of use in the diagnosis of fetal distress.

Electrocardiography is done by firmly placing on the linea alba the two electrodes, which form the two feet of a metal box containing the preamplifier. A metal belt for the indifferent electrode is placed round the mother's waist between the uterine fundus and the heart. Owing to extraneous disturbances the records of P and T waves are difficult to distinguish with certainty, but the QRS complex can be recorded faithfully in amplitude and duration. If clinical requirements necessitate a full fetal electrocardiogram with P and T waves, as in fetal distress, or before emergency cesarean section, then intrauterine electrodes are passed through the cervical canal, preferably after rupturing the membranes, and their positions ascertained radiographically if necessary. The principal uses of electrocardiography are for the differential diagnosis of pregnancy and multiple pregnancy from tumors; for evidence of fetal life in cases of threatened abortion; for differentiation of breech from cephalic presentation; and to demonstrate the presence of fetal cardiac abnormalities, such as myocardial failure, impeded circulation, and fibrillation. The electrocardiographic diagnosis of heart block normally requires intrauterine electrodes. Records were obtained during electrocardiography which were thought to be due to discharges from the fetal brain. Further improvements in technique are needed before these can be interpreted. They may be artifacts.

"On Call to a Nation".—The British Broadcasting Corporation celebrated the 10th anniversary of the introduction of the National Health Service by televising a documentary film entitled "On Call to a Nation." The film, lasting for 75 minutes, was the longest documentary ever made by the B. B. C. There were no professional actors in it. All the parts were taken by physicians, dentists, and medical personnel working in their usual surroundings in the hospital clinic or in general practice. The film was not intended to show the inner working of the Health Service but rather to show physicians in action and to obtain their views of the Service. Fifty-seven physicians appeared and 25 of them spoke. They included those in urban and rural practice, those with large and small patient lists, those in group practice, and hospital specialists. As payment in general practice is on a per capita basis, it is significant that an urban general practitioner with a large list said that he approved of the Service, while one in a rural area with few patients, who had to travel great distances to see them, did not. Other practitioners and specialists also had various reservations and criticisms to make. A consultant dictating letters at the end of an outpatient session gave his views. Another pointed out the cost of the Health Service to the nation and the public's responsibility for financing it. A pricing bureau was shown dealing with millions of prescriptions to highlight the cost of drugs. The need for increased capital expenditure was emphasized by views of old hospitals and temporary buildings that had long outlived their usefulness. General practitioners were shown seeing their patients. Professional bodies had been consulted, but the planning and direction of the film were done independently.

Poliovirus in Children Under Five Years of Age.—An investigation by the Public Health Laboratory Service showed that about 0.2% of children under 5 years of age are symptomless carriers of poliovirus, the figure rising to 2.5% at the height of an epidemic (*Monthly Bulletin Public Health Laboratory Service,* Oct., 1958, p. 231). The real figure is probably higher than this, as the method of isolating the virus was not entirely satisfactory. The results were based on a survey of 21 areas, both urban and rural, in England and Wales. This carrier rate was found to follow the seasonal curve of poliomyelitis incidence fairly closely at first, but fell off more slowly than that of the reported cases. No clearcut relation between carrier rate and incidence of reported poliomyelitis was found, although there was a rough correlation between the two. The areas studied fell into two groups, with high and low carrier rates respectively. In those with the high carrier rates there were about 50 carriers for every reported case and in the low group the corresponding ratio was about 15:1.

Rockefeller Grant.—The Council of the Royal Society of Medicine announced that the Rockefeller Foundation had offered a grant of $67,370 to the Society for the support of its library over the next five years, while endowments are being sought to ensure its service and maintenance. The library contains 400,000 volumes and nearly 2,000 current periodicals. It is used by more than 60,000 readers annually.

Nobel Prize Winner.—Dr. F. Sanger, head of the Medical Research Council's biochemistry research unit at Cambridge, was awarded the Nobel Prize for Chemistry. After 10 years' research he identified the amino acid constituents of insulin. Four years ago he was made a Fellow of the Royal Society and of King's College, Cambridge.

CORRESPONDENCE

ORGAN PLAYING

To the Editor:—Although the Leisure Corner item in the Oct. 11, 1958, issue of THE JOURNAL, entitled "Playing the Modern Organ" is interesting, two points should be clarified. In the early so-called water organs, the water was not used to create the air pressure to make the pipes speak, but rather was used in the manner of a diving bell to keep the air pressure constant and thus to keep the tone of the pipe in pitch. In the first paragraph of the article, it is stated that the organ is easy to play, and later, that the modern organ is probably the easiest of all instruments to play. If by organ we mean the instrument on which most of the pieces written for organ can be played, it would have to have two or more manuals and 32 pedals. This instrument is not easy to play. Some organ teachers require six years study on the piano before they will permit a student to start on the organ. A person, by reading the Leisure Corner article, might be misled into believing he could play serious organ music without a lot of hard work, which is not true.

H. H. SHULL
259 W. Tulpehocken St.
Philadelphia 44.

MAMMARY CARCINOMA

To the Editor:—I am disturbed by the erroneous impression given by the editorial on mammary carcinoma in THE JOURNAL (168:1228 [Nov. 1] 1958). It would appear from the editorial that the only type of endocrine therapy worth while is surgical removal of either the ovaries, the adrenals, or the pituitary. I believe that this is not only a fallacious impression but is not in the best interest of patients. While the administration of endocrine preparations is mentioned, the editorial states only that the drugs are especially useful in getting patients in better condition for ovariectomy or adrenalectomy and in treating patients with cerebral metastases, hypercalcemia, and lymphedema. I am afraid that many people will be deprived of years of useful remission from hormonal therapy if such treatment is limited to these indications. I agree that ablative therapy is an impressive *tour de force* to the patient, but one cannot ignore the fact that such procedures still work after hormonal preparations have been given and also that, in general, these procedures should not be performed just anywhere by anyone. Adrenalectomy may be technically easier than hypophysectomy, as was pointed out, but it is still an extensive major procedure and the patient is left living a precarious life forever after.

ALBERT SEGALOFF, M.D.
3503 Prytania St.
New Orleans.

MEDICAL FILM REVIEWS

Machine Mimics Man: The Artificial Kidney: 16 mm., color, sound, showing time 26 minutes. Prepared by Willem J. Kolff, M.D., Cleveland, and George E. Schreiner, M.D., Washington, D. C. Produced in 1958 by Mervin LaRue, Inc., Chicago, for and procurable on loan from Travenol Laboratories, Inc., Division of Baxter Laboratories, Morton Grove, Ill.

By animation and clinical photography this film shows, step by step, the ease of setting up the Travenol Twin-Coil Kidney and the speed with which hemodialysis is available to the patient. Also reviewed are normal kidney function, the basic principles of hemodialysis, and its role in renal insufficiencies and certain systemic poisonings. The important thing about this film is its instructive mechanical aspects for anyone who might be interested in applying this form of therapy. The procedure has gradually been simplified until the Travenol Twin-Coil Kidney seems to offer the most efficient means of hemodialysis available at the present time. The basic principles of hemodialysis and its therapeutic possibilities, in patients with renal insufficiency, especially that which follows systemic poisoning, and other difficulties which call for temporary dialysis, are simplified for quick comprehension. The only criticism to be leveled at this excellent film would be that the explanation of procedure makes it seem almost too simple and might delude some persons into thinking it foolproof. This, of course, is far from the truth, and anyone applying this more or less portable unit should have a thorough basic understanding of the entire subject. The film is highly recommended for showing widely as an educational feature and should be a "must" for any and all newcomers to the field of hemodialysis who are contemplating use of the Travenol Twin-Coil Kidney.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

A Reversible Nephrotic Syndrome Associated with Congestive Heart Failure. W. R. Burack, J. Pryce and J. F. Goodwin. Circulation 18:562-571 (Oct.) 1958 [New York].

A nephrotic syndrome is an unusual and puzzling complication of chronic heart failure. The authors report 4 patients in whom severe proteinuria, hypoproteinemia, massive edema, hypercholesterolemia, and a strikingly abnormal plasma electrophoretic pattern developed in the course of congestive heart failure. The blood urea level was normal or only slightly elevated, and the urinary sediment was normal. Three of the 4 patients recovered from the nephrotic syndrome over a period of 9 months on a regimen of digitalis, low-salt and high-protein diet, and regular, weekly, intramuscular administration of mercurial diuretics. Aminophylline given intravenously just prior to the mercurial was found to enhance the diuretic response.

Reference is made to the little understood but common phenomenon of proteinuria in heart failure. The possible relationship of the proteinuria to the occasional case of nephrotic syndrome is discussed. It is concluded that the nephrotic syndrome occurring in chronic heart failure is not caused by mercurial diuretics and is not in itself a contraindication to their continued use.

The Frequency of Postprimary Pulmonary Tuberculosis According to Pulmonary Arterial Pressure. S.-B. Mattson. Am. Rev. Tuberc. 78:536-546 (Oct.) 1958 [New York].

The author points out that it has been debated for more than a century whether or not certain cardiac valvular defects confer increased resistance to pulmonary tuberculosis. No uniform opinion has been reached. This report describes another attempt to elucidate the question of pulmonary tuberculosis in organic heart disease. The case material for the study was obtained from 2 cardiac clinics in Stockholm, which accept patients from all of Sweden. All cases of congenital cardiac anomaly or of mitral disease in which heart catheterization was performed during the years 1948-1956 were reviewed. The series was confined to persons more than 15 years old. Most of these 413 persons had been referred to the clinics with a view to surgical relief of the cardiac defect. The patients were classified according to the pressure in the pulmonary artery. This pressure was high in 261 patients, normal in 91, and low in 61. Postprimary pulmonary tuberculosis was present in 1% of the hypertensive patients, in 3% of the normotensive group, and in 13% of the hypotensive group. The difference in tuberculosis frequency (10%) between the normotensive and the hypotensive patients was statistically significant. The corresponding difference (12%) between the hypertensive group and the hypotensive group was likewise significant.

Silicotuberculosis: Results of Medical and Combined Medical-Surgical Therapy. C. S. Morrow and M. Kantor. Am. Rev. Tuberc. 78:524-535 (Oct.) 1958 [New York].

The patients studied were hard-coal miners. All were admitted to the hospital between Sept. 10, 1952, and Dec. 1, 1956, and had bacteriological confirmation of the diagnosis of pulmonary tuberculosis. Several sputum specimens contained tubercle bacilli on microscopy and/or culture. All had roentgenographic evidence of silicotuberculosis, had had no previous course of chemotherapy, and were treated continuously with antituberculous drugs for at least a 6-month period in the hospital. Twenty-five patients participated in this study, and all but one satisfied the criteria; in the one exception, the chemotherapy had been interrupted for a relatively short period of time. All but 6 of the patients were between 50 and 70 years of age, and these patients had worked in the mines for about 30 years.

Nineteen of the patients received chemotherapy alone, chiefly streptomycin and isoniazid; the other 6 with unilateral cavitary disease were subjected, in addition, to various thoracic surgical procedures. The results of chemotherapy alone, from the standpoint of cavity closure along with reversal of infectiousness, were poor as compared with those for patients with nonsilicotic tuberculosis. The results of chemotherapy and surgery in the 6 patients were good, particularly with the resectional procedures. If chemotherapy alone is to play a significant role in silicotuberculosis, it would appear advisable to

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. *Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order.* Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

regard conglomerate disease in its initial stages as tuberculous, in the presence of a positive tuberculin test, and to treat it as such if only to prevent further conglomeration.

Local Reactivation of the Primary Tuberculous Focus in the Lung. J. Snijder and T. Vossenaar. Am. Rev. Tuberc. 78:547-564 (Oct.) 1958 [New York].

The primary pulmonary focus has a tendency to a stereotyped course, complications due to inflammation in the regional lymph nodes being fairly frequent, but the pulmonary focus usually subsides and often becomes calcified. In the rare cases in which the primary focus is progressive, 2 types of local extensions occur. 1. Extensions occur before the focus has subsided (type 1). 2. The pulmonary focus becomes reactivated when the primary complex has been quiet for years (often containing calcium), and the patient meanwhile has been considered healthy (type 2). At the "Berg en Bosch" Sanatorium in Bilthoven, The Netherlands, cases of type 2 reactivation were collected. Their rarity is demonstrated by the fact that among 4,554 patients who were discharged from "Berg en Bosch" there were 12 with a local reactivation of an already subsided pulmonary focus; thus, the frequency was about 0.25%. Seven of these patients were less than 15 years old, and the remaining 5 ranged from 15 to 27 years of age. The authors now have under observation a 14-year-old girl with the same condition; thus, a total of 13 instances have been studied.

In 12 of 13 cases the diagnosis could be based on accurate data: in 8 patients the primary complex in its active stage had been recorded on chest films, and in 4 patients a partly calcified primary complex, which had subsided before the onset of the present disease, could be demonstrated from the roentgenograms. In the remaining case the diagnosis was practically certain. Complaints and symptoms were hemoptysis, high temperature accompanied by general malaise, cough, expectoration, fatigue, weakness, and loss of weight. Acceleration of the erythrocyte sedimentation rate and changes in the differential leukocyte count were also observed. Not every patient had all these symptoms, but tubercle bacilli were present in the sputum almost without exception. Depending on the nature and the extent of the liquefaction in the focus, tubercle bacilli in the sputum varied from large numbers seen on microscopy to an occasional one obtained only by culture. The causes of reactivation could not be determined from either the history or the clinical data.

Roentgenographically, the fairly voluminous foci were usually sharply demarcated from the surrounding tissue. The size varied from that of a cherry to that of a chestnut, but one focus was as large as a hen's egg. Nearly all the foci (11 of 13) contained calcium. All foci but one contained a cavity. Except in one case, the cavity was fairly small as compared with the size of the focus. A striking feature was the eccentric position of the cavity, which was invariably situated opposite the calcium deposits. The local extension was accompanied by disseminations, which in the majority of cases were limited to small foci in the immediate surroundings of the large focus. Nine of the foci were localized subpleurally.

The authors regard local reactivation of an initially subsided primary tuberculous pulmonary focus as an indication for a pulmonary resection. The treatment was nonsurgical in only 2 of the patients. In the 11 patients who were operated on, the postoperative course was uneventful, and a satisfactory reexpansion was obtained. All the patients remained in excellent condition after discharge from the sanatorium. Examination of the resected foci showed that they were composed of a small, older portion and a larger, more recent area. The older part consisted of a largely calcified caseous focus. Mycobacterium tuberculosis was exclusively found in the recent area, in the liquefied caseum. In 3 cases, in which the caseous material of the focus was cultured for tubercle bacilli, viable tubercle bacilli were present.

The Effectiveness of Long-Term Treatment of Malignant Hypertension. H. P. Dustan, R. E. Schneckloth, A. C. Corcoran and I. H. Page. Circulation 18:644-651 (Oct.) 1958 [New York].

A majority of patients with hypertension die prematurely, not of hypertension or hypertensive vascular disease as such, but of complications of hypertensive and coronary heart disease, cerebrovascular damage, or some other arterial (not arteriolar) catastrophe. Potent antihypertensive drugs have been in use for 7 or 8 years, but with a lack of information on the relation between the cause of death and the extent of arteriolar damage it is impossible to assess therapeutic gains in terms of prolongation of life or prevention of complications. The situation is quite different in the malignant (accelerated) phase of essential hypertension. The course of this hypertensive syndrome is well characterized, predictable, and relatively brief, with survival of only 10 to 20% of patients for one year. Death is caused primarily by hypertensive arteriolar vascular damage. This is commonly expressed by malignant nephrosclerosis with rapidly progressive renal failure, by intracerebral hematoma, and not infrequently by uncontrollable cardiac failure.

Surveying the courses of 84 patients with malignant hypertension who received treatment with potent antihypertensive agents during the past 7 years, the authors found that 70% survived 1 year of observation; 50%, 3 years; 33%, 5 years; and 26%, 6 years. These survival rates represent substantial therapeutic gains over survival rates in the untreated series of Keith, Wagener, and Barker. The first-year survival rate was weighted by the untoward complication of hexamethonium pneumonitis, and current survival is greater. Other causes of death were rapidly or slowly progressive renal failure and complications of atherosclerosis. The rapidly progressive renal failure was usually associated with poor control of blood pressure. It seemed merely an attenuation of the usual course of malignant hypertension. The syndrome of delayed or slowly progressive renal failure was associated with diffuse occlusive fibrous intimal hyperplasia of major renal arteries. Among the complications of atherosclerosis, cerebral hemorrhage was the most common and was associated with poor control of blood pressure level, while myocardial infarction, the next most common, was not.

It may be that the coronary arteries, like the renal, are subject to progressive occlusive disease in some patients with treated malignant hypertension. It is not clear whether this process represents a continuation in vessels larger than arterioles of a basic vascular disease or a delayed response on the part of the arteries to preexisting severe hypertension. Survival was better in patients who were treated before malignant hypertension had caused extensive vascular damage. Patients who presented themselves for treatment with evidences of severe renal damage generally did not survive for long periods. However, several such have maintained active lives for many months and years. Hence, treatment should be withheld only in the most desperate circumstances.

Temporary Collapse in the Treatment of Pulmonary Tuberculosis. F. T. Rogue. Dis. Chest 34:404-412 (Oct.) 1958 [Chicago].

Rest has generally been accepted as fundamental in the treatment of pulmonary tuberculosis. Tuberculosis sanatoriums were established to provide a haven of rest for those afflicted with the disease as well as to segregate them from the general population. Temporary collapse measures, namely, artificial pneumothorax, pneumoperitoneum, and phrenic nerve paralysis, basically are attempts to secure rest by so-called "splint" or "selective collapse" of diseased lungs. The author reports on the changing status of these temporary collapse measures in the past 10 years at Fitzsimons Army Hospital in Denver and gives his own views based on experiences since 1933. He regards artificial pneumothorax and phrenic nerve paralysis as obsolete procedures. If after adequate use of antituberculous drugs cavitary lesions constitute caseonodular residuals that involve the threat of recurrence, surgical excision is the procedure of choice. Pneumoperitoneum may be used as a last resort in far-advanced cases when, after adequate and prolonged chemotherapy, surgical excision of cavities and/or serious residuals cannot be performed because of serious impairment of pulmonary function. Pneumoperitoneum may be considered also in those rare patients in whom chemotherapy cannot be used because of severe toxicity.

The Effect of Treatment on Mortality Rates in Severe Hypertension: A Comparison of Medical and Surgical Regimens. H. M. Perry Jr. and H. A. Schroeder. A. M. A. Arch. Int. Med. 102:418-425 (Sept.) 1958 [Chicago].

The mortality rates of 209 patients with severe hypertension, treated orally with such a ganglion blocking agent as hexamethonium chloride and with hydralazine hydrochloride, have been compared with the mortality rates reported in the literature as being associated with other antihypertensive regimens, particularly surgical sympathectomy. The comparison was made difficult by the differing criteria used by various authors in grading the severity of the disease prior to therapy. Because effective antihypertensive drugs have been used for a relatively short period, they could be evaluated only in seriously ill patients with significant and predictable mortality rates during the available observation period. This series of previously untreated nonuremic patients, 23 of whom were Negroes, were divided on the basis of their pretreatment status into 2 groups, according to Smithwick's classification; thus, 79 patients were classified as group 3, and 130 as group 4. Their ages ranged from 27 to 70 years, with an average of 49 years. All the patients were followed for 4 years. Of the 130 patients in group 4, 48 had benign hypertension, and 82 were considered to have malignant hypertension, which was associated with azotemia in 35 without evident cardiac failure or any of the common signs of uremia and 47 were nonazotemic. All 82 patients with malignant hypertension had proteinuria and papilledema; 77 had hemorrhagic and exudative retinitis, while 3 had only hemorrhages and 2 only exudates. Each of the 82 patients had a mean supine diastolic pressure of over 130 mm. Hg.

Therapy with the oral administration of hexamethonium chloride and hydralazine hydrochloride was instituted according to a regimen involving an invariant dose of hydralazine plus a variable dose of the ganglion blocking agent 5 or 6 times a day, with the dose of the latter depending on the level of systolic pressure. During the 4 years after the institution of therapy, the mortality was lower in this series of patients treated with a combination of ganglionic blockade and hydralazine than it was in Smithwick's reported series of surgically sympathectomized patients. If the severity of the cardiovascular disease in the group 4 patients was graded on the basis of both hypertensive and atherosclerotic processes, the mortality rate of the patients who were medically treated was 43% and that of the patients who were subjected to operation was 48%. In the nonazotemic patients with malignant hypertension, if classification was based only on the hypertensive process, the mortality rate of the patients who were medically treated was 36% and that of the patients who were operated on was 48%. For all groups of nonazotemic patients who survived the first year of medical treatment with adequately controlled diastolic pressure, the mortality rate approximated 10% during the next 3 years. Mortality was related to race, being noticeably higher among Negroes, but was relatively independent of sex, age, and economic status.

Second Field Evaluation of Bivalent Types 4 and 7 Adenovirus Vaccine. M. R. Hilleman, H. H. Greenberg, M. S. Warfield and others. A. M. A. Arch. Int. Med. 102:428-436 (Sept.) 1958 [Chicago].

A second field evaluation of bivalent types 4 and 7 adenovirus vaccine, prepared by Lederle Laboratories by commercial production procedures, was carried out at Fort Leonard Wood, Mo., during the winter of 1957. The study proved the high degree of efficacy of this vaccine for preventing acute respiratory diseases of different causes in newly recruited soldiers. The incidence of various respiratory diseases was 11.0% among the 2,471 vaccinated subjects and 23.8% among persons of the control group who received a formalin-saline placebo; thus, a reduction of 55% in the attack rates for total respiratory diseases was obtained by the vaccine. The protective effect of the vaccine became evident about 7 days after vaccination. The adenovirus specific attack rates, calculated on the basis of serodiagnostic tests on an approximate 50% sample of cases, were 1.6% in the vaccinated subjects and 16.6% in the control group, and the reduction in cases was 90%. These findings compared favorably with a 98% reduction figure obtained earlier in a study. The complement-fixation test used in this study proved to be a highly reliable diagnostic means of determining whether the respiratory disease was caused by adenovirus even in vaccinated subjects.

Adult civilian groups have shown very low attack rates for adenovirus-caused respiratory disease; therefore, general vaccination of such persons is not justified. There may be a greater need for the vaccine among children and infants. Whether the attack rates in children are sufficiently high to warrant general use of an adenovirus vaccine, what particular types of adenovirus should be included in the vaccine, and whether the vaccine is effective in preventing respiratory diseases caused by adenovirus infection are questions that require further investigation. In taking into consideration the use of adenovirus vaccine in any group of the population, one should bear in mind that this vaccine is ineffective against the common cold.

Production of Hepatic Coma by Carbonic Anhydrase Inhibitors in Patients with Hepatic Cirrhosis. E. Rissel, H. Schnack, N. Stefenelli and F. Wewalka. Schweiz. med. Wchnschr. 88:946-951 (Sept. 27) 1958 (In German) [Basel, Switzerland].

When ascites develops in patients with decompensated cirrhosis of the liver, the removal of water represents one of the most important problems. Among 85 patients with hepatic cirrhosis who were treated with acetazolamide (Diamox), the authors observed 9 patients who had precomatose or comatose episodes. It was found that the comatose attacks that followed the administration of Diamox corresponded to the "ammoniacal encephalopathy" that develops in patients with hepatic cirrhosis either spontaneously or after the administration of ammonium chloride or cation exchange agents that liberate ammonia, after intestinal hemorrhages, or after high-protein diets. The development of the comatose condition is not dependent on the dose of Diamox. As in spontaneous liver coma, the blood ammonia content showed a noticeable increase in all except one patient in whom Diamox had brought on a comatose state.

Frequently the comatose attacks were reversible, but they may also cause death of the patient. In some patients the coma could be counteracted by the intraperitoneal administration of from 200 to 500 cc. of a 10% solution of glutamate. The administration of potassium prior to Diamox treatment prevented the comatose disturbance in only one patient. In most of these 9 patients Diamox failed to exert a diuretic effect. The administration of Diamox was followed by comatose attacks only in patients with advanced hepatic cirrhosis, such as those in whom coma-like attacks had been elicited by other mechanisms. The prognosis was extremely poor in these patients. All except 2 died within 5 months after the first Diamox-induced comatose attack.

The blood ammonia content was investigated in 12 cirrhotic patients in whom Diamox did not cause coma, and it showed no uniform behavior. Simultaneously existing chronic renal diseases exerted no influence on Diamox tolerance. The large majority of patients with hepatic cirrhosis reacted to doses of 250 mg. of Diamox on 3 successive days, or to 125 mg. of Diamox daily for from 2 to 4 weeks, without showing any coma-like disorders. A hypochloremic coma, such as has been observed after the use of mercurial diuretics, was never observed by the authors. They conclude that, if suitable precautions are taken, Diamox can be used even in decompensated patients with cirrhosis and that it has definite advantages over mercurial diuretics.

Selected Aspects of Acute and Chronic Gouty Arthritis: An Internist's Interpretation of an Orthopaedist's Experiences with Gout and Gouty Arthritis. J. H. Talbott. J. Bone & Joint Surg. 40A:994-1002 (Oct.) 1958 [Boston].

The arthritis clinic at the Buffalo General Hospital is especially interested in gout and gouty arthritis and, because of this special interest, has had an opportunity to consider the varied problems of the patient with acute gouty arthritis as well as the patient with chronic tophaceous gout. There are several features of gout and gouty arthritis of particular interest to the orthopedic surgeon. A presumptive diagnosis of acute gout should be entertained in any unexplained acute inflammation of one or more joints, particularly in an adult male. A family history of gout, renal lithiasis, or other ancillary features may be noted. Most important is a clinical description of the acute attack, which displays the cardinal signs of inflammation and may be associated with pyrexia, leukocytosis, and an elevated sedimentation rate. Confirmation of the diagnosis rests upon a prompt response to a full course of colchicine. The level of serum uric acid is not a reliable diagnostic aid. Roentgenographic evidence in the earlier years of the disease is confined to soft-tissue swelling at the time of the acute attacks.

The cause of the acute attack is not known. The pathogenesis of the underlying metabolic disturbance is associated with an increased formation of uric acid by the body. Diminished destruction and impaired excretion by the kidneys as a cause have not been supported by contemporary research. Precipitating factors include surgical intervention, acute infection, emotional trauma, local trauma, and certain drugs, such as penicillin, ergotamine tartrate, vitamin B_{12}, mercurial diuretics, and thiamine hydrochloride, each when administered intravenously. The prognosis in gout is excellent if the prophylactic regimen is followed. This involves the administration of colchicine and a uricosuric agent (probenecid) daily in moderately or severely afflicted patients and less often in those mildly afflicted. If the prophylactic regimen is followed, little or no incapacity needs result.

Deleterious Effect of Intra-articular Hydrocortisone. G. N. Chandler and V. Wright. Lancet 2:661-663 (Sept. 27) 1958 [London].

In a controlled trial of intra-articular steroid therapy in rheumatoid arthritis, both hydrocortisone acetate and hydrocortisone tertiary-butyl acetate were found to give significant clinical improvement lasting several weeks. Four injections of each drug and 4 of placebo were given into the knees over a period of 48 weeks, during which physical grading and functional capacity were measured every 2 weeks. Roentgenograms of the knees were obtained before and after the trial. Both drugs were more effective than the placebo, but despite the generally good clinical response to injections of the hydrocortisone preparations roentgenologic evidence of deterioration, sometimes considerable, was found in the knees of more than half of the patients so treated. Eighteen patients with 25 involved knees completed the trial. Roentgenologic deterioration was observed in 13 joints. Thus, intrasynovial injections of hydrocortisone and related compounds either failed to halt or, more usually, accelerated pathological changes, despite the clinical relief enjoyed by the majority of patients.

This apparent paradox of worsening disease in the face of clinical improvement was subjected to further investigation. No significant association could be traced between the effects of treatment on pain and the range of movement in the 2 groups of patients with and without roentgenologic progression of arthritis. An important difference between the groups was apparent, however, in respect to walking time; a trend toward greater improvement at the 2nd week after treatment in the group with deterioration became very significant at the 6th week. It must be concluded that the principal effect of treatment in this group has been the attainment of a standard performance beyond the capacity of the joint. The discrepancy between the effects on pain and walking time in the 2 groups was probably more apparent than real, for the quantification of pain is notoriously imprecise. The fact that it was not until the 6th week after treatment that improvement in walking time became significant in the group with roentgenologic deterioration suggests that the chief cause for roentgenologic progression was the encouragement of a damaging level of performance by interference with a normal, locally protective mechanism.

A Contribution to the Mycology of the Mouth. E. C. Fox and G. C. Ainsworth. Brit. M. J. 2:826-828 (Oct. 4) 1958 [London].

During recent years particular attention has been paid to mycotic infections of the oral cavity as a complication of antibiotic therapy. In an effort to supply data on the mycology of the mouth in relation to a number of fairly common oral lesions, isolations of fungi were made from patients at Birmingham Dental Hospital during 1952 to 1955 to ascertain whether there were any relationships between fungi and these oral disorders. The isolations were made in the clinic by inoculating slopes of malt extract agar with scrapings taken with a sterile scalpel. Incubation was at 20 to 25 C, and any fungi which developed were obtained in pure culture for identification. Bacteria and actinomycetes were ignored. Twenty-six of 175 patients were excluded from further study, because they had conditions which showed no distinctive mycological findings, such as lichen planus, lupus erythematosus disseminatus, leukoplakia, fungating antrum carcinoma, and dry socket. The remaining 149 patients were grouped as having 6 clinical conditions, namely, angular cheilosis, gingivostomatitis (comprising aphthous, herpetic, acute ulcerative, mycotic, and various stages of inflammatory periodontal conditions), lingua nigra, lingua geographica, coated tongue, and denture sore mouth.

In some persons of the control series (groups of school children, university students, and professional and office workers) isolations were made as in the patients, but in others saliva was sampled by a single swabbing of the tongue, gums, and teeth and by streaking plates or slopes of malt agar with the swab. From the mycological findings in the 149 patients with angular cheilosis, gingivostomatitis, lingua nigra, lingua geographica, coated tongue, and denture sore mouth, it is concluded that Candida albicans seems to play a primary part in the etiology of angular cheilosis and has some connection with the etiology of gingivostomatitis. The diverse fungi associated with the remaining 4 conditions are of uncertain etiological significance.

Rheumatoid Arthritis of the Cervical Spine in the Adult. J. Sharp, D. W. Purser and J. S. Lawrence. Ann. Rheumat. Dis. 17:303-313 (Sept.) 1958 [London].

The authors studied the roentgenologic changes produced in the cervical spine by rheumatoid arthritis in adults, and they also investigated whether such changes may occur as the only evidence of rheumatoid arthritis, that is, without clinical or roentgenologic signs of the disease elsewhere. A series of lateral roentgenograms of the cervical spine from 44 hospital patients, aged 55 to 64 years, who had rheumatoid arthritis were compared with a series from persons of the same age and sex distribution selected at random from the general population. The films from rheumatoid subjects showed more narrowing of the upper cervical disks. This disk narrowing was more often associated with erosion of the vertebral plates and less often with sclerosis or osteophyte formation, and in the apophyseal joints there were more destructive changes. The roentgenograms from nonrheumatoid subjects showed more proliferative changes. In rheumatoid subjects, vertebral subluxations were more frequent and more severe at all levels of the cervical spine.

With the use of these criteria, a series of 428 cervical roentgenograms from random samples of the population were graded for the changes of cervical rheumatoid arthritis. Definite evidence of rheumatoid arthritis was found in the roentgenograms of 6% of the men and 7% of the women. There was a relationship between the roentgenologic grading for rheumatoid arthritis in the cervical spine and a positive sheep-cell agglutination test. There was little or no correlation between these roentgenologic gradings for cervical rheumatoid arthritis and either morning stiffness or a clinical diagnosis of rheumatoid arthritis, or with a diagnosis of rheumatoid arthritis made in accordance with the criteria of the American Rheumatism Association. There was, however, an association between roentgenologic signs of rheumatoid arthritis in the cervical spine and similar signs in the hands and feet. A cervical form of rheumatoid arthritis without peripheral joint involvement may account for an important number of apparently false-positive reactions in the sheep-cell agglutination test.

Clinical-Neurological Study of 21 Cases of Botulism. C. Castedo, M. Hermida and H. Puricelli. Acta neuropsiquiát. argent. 4:118-126 (April-June) 1958 (In Spanish) [Buenos Aires].

An outbreak of botulism in 21 patients who ate canned pimentos in the same restaurant in La Plata, Argentina, between June 2 and 6, 1957, is reported. Toxicity of the suspected food was proved by feeding it to animals. There were 12 fatal and 9 mild cases. The period between ingestion of the toxic food and appearance of symptoms varied between 14 and 48 hours. The early symptoms consisted of nausea, vomiting, dizziness, headache, and asthenia. In patients with severe intoxication, the early symptoms were followed by blurred vision, mydriasis, ptosis, diplopia, strabismus, lack of or delayed pupillary responses, and paralysis of several cranial nerves. In patients with mild intoxication, the predominant symptoms were exclusively oculomotor.

The treatment of these patients consisted of the administration of antibotulinic serum which was specific for types A and B of Clostridium botulinum. The serum was titrated in 2,000 units per cubic centimeter and was administered according to the following scheme: All patients had an intramuscular injection of 10 cc. (20,000 units) of the serum as soon as they reported to the hospital. If ingestion of the toxic food had been moderate and the symptoms abated during a week, a second and final intramuscular injection of the same dose of antibotulinic serum was given, and the patient was discharged. If ingestion of the food had been considerable but the symptoms had diminished after the first injection of antibotulinic serum, the injections were repeated at certain intervals; they were given intramuscularly up to a total dose which varied between 60,000 and 200,000 units. Patients who were hospitalized in a grave condition were given a total dose of 320,000 units of the antibotulinic serum, which was administered as follows: 100,000 units intramuscularly, 200,000 units intravenously, and 20,000 units intrathecally.

Antibotulinic serum therapy was given with the necessary precautions of testing the tolerance of the patients and in association with antihistaminic drugs. Ten of the 12 severely ill patients were treated also with ganglionoplegics and barbiturates as a preliminary to placing them in the pulmotor. Specific antibotulinic serum therapy failed to save the 12 patients who were hospitalized with acute symptoms of severe intoxication. This group included a patient in whom the treatment was started before the appearance of oculomotor symptoms. The botulism toxin seems to block the nonmyelinated endings of the nerve fibrils at the motor plate, inhibiting the production of acetylcholine which controls the neuromuscular synapsis.

SURGERY

Osteogenic Sarcoma of the Jaws and Facial Bones. L. V. Kragh, D. C. Dahlin and J. B. Erich. Am. J. Surg. 96:496-505 (Oct.) 1958 [New York].

The authors report on 9 male and 10 female patients, between the ages of 11 and 60 years, with osteogenic sarcoma of the mandible, on 10 men and 4 women, between the ages of 16 and 62 years, with osteogenic sarcoma of the maxilla, and on 6 men and 5 women, between the ages of 15 and 55 years, with osteogenic carcinoma of the antrum and ethmoid region, who were treated at the Mayo Clinic before March, 1957. Most of the patients were treated surgically with or without adjunctive irradiation therapy. Several patients who received limited surgical treatment elsewhere were cured subsequently by more radical therapy, which consisted of wide surgical resection or diathermy destruction of the lesion and surrounding tissues. Eleven of the 44 patients were still living at the time of follow-up in March, 1957, and in addition 1 patient was known to be alive and well 6 years after treatment. Of the 35 patients treated before March, 1952, 11 are known to have lived for periods ranging from 5 to 28 years after their first definitive treatment at the Mayo Clinic. Six of these had mandibular, 4 had maxillary, and 1 had antral sarcoma. Of these 11 survivors, 5 had chondroblastic, 4 fibroblastic, and 2 osteoblastic osteogenic sarcomas. Neither patient with primarily ethmoidal involvement survived 5 years. Two patients died of recurrent tumor or metastasis 13 and 6 years, respectively, after their first treatment at the Mayo Clinic.

These data show that surgical treatment affords a reasonable chance of cure. A tendency to late systemic spread and a relatively low average degree of malignancy are among the factors that contribute to successful therapy. In the 44 patients symptoms were commonly present and led to many dental and minor surgical procedures before the correct diagnosis was established. This fact emphasizes that a relatively painless nonulcerating mass occurring in the upper or the lower jaw, particularly about an alveolus, should suggest the possibility of osteogenic sarcoma. In the antral and ethmoid regions, early symptoms are lacking. Roentgenographic examination is extremely helpful in most instances, but definitive diagnosis depends on histological studies. In 4 patients the sarcomas arose in regions previously irradiated for benign conditions of bone or soft tissue. More alertness on the part of dentists and physicians would favor earlier correct diagnosis and treatment of osteogenic sarcoma of the jaw.

Considerations and Comparisons of Ligation of the Internal Mammary Arteries: Operation According to the Technique of Davide Fieschi: Experimental Study. C. Zagnoni and P. Ziliotto. Acta chir. italica 14:511-538 (July-Aug.) 1958 (In Italian) [Padua, Italy].

The authors investigated in dogs and in human beings the efficacy of the operation devised by Davide Fieschi for the treatment of coronary insufficiency. This operation consisted of ligation of the internal mammary arteries at the level of the second or the third intercostal space. After ligation a solution of turpentine oil and of ultrafiltered lead tetroxide (minium) was injected into the internal mammary arteries close to their origin, into the coronary arteries, or into the arteries of the pericardium to observe possible passage of the radiopaque substance to the vascular net of the pericardium. At the point of ligation of the internal mammary arteries only a slight and transitory increased blood pressure was observed. However, at the point of ligation a marked increase in the oscillometric rate was noted. It was accompanied by an increased flow into the main collaterals of the ligated artery, which included the pericardium-phrenic vessels. The pericardium-phrenic vessels did not, however, make any significant anastomotic connection with the coronary system. This was observed both in dogs and in human beings. It seemed that the increased flow in the pericardium-phrenic system was a normal and proportional compensation for the interrupted circulation of the main branch. This additional flow into the pericardial system was small and of practically no clinical advantage.

The ultrafiltered minium which was injected into the internal mammary arteries brought into relief the system of the arteries of the pericardium, and it penetrated into the coronary system only through a considerable circumvention. The additional pressure on the coronary system of both humans and dogs with a normal or a defective heart was weak. Likewise, the ultrafiltered minium injected directly into the coronary system of both humans and dogs with a normal or a defective heart spread through many ascending branches of the coronary arteries but did not penetrate into the pericardial system. Consequently, this experiment demonstrated a relative independence of the arterial system of the pericardium from that of the coronary arteries. The authors suggest that for the treatment of coronary insufficiency it is better to apply surgical operations designed to establish a direct vascular connection between the arteries of the pericardium and those of the heart than to resort to ligation of the internal mammary arteries.

Clinical Comparison of Homografts and Braided Nylon in Arterial Bypass Surgery. R. P. Hohf, O. H. Trippel and H. Laufman. A. M. A. Arch. Surg. 77:552-560 (Oct.) 1958 [Chicago].

A group of 33 femoral and iliofemoral homografts were compared with a group of 23 Edwards-Tapp nylon prostheses in a series of 45 patients with bypass procedures. Of 33 homografts inserted, 13 remained patent, and 20 were failures; of the 20 failures, 9 occurred early and 11 late. The 23 nylon prostheses procedures resulted in 10 successes and 13 failures, of which 6 were early and 7 late. Poor distal run-off was considered the cause of 60% of the homograft failures and 54% of the nylon failures. A nylon prosthesis lasted 5 months in an exposed wound, but an exposed homograft softened and ruptured after only 2 weeks. Comparison of the results with homografts and with nylon prostheses in this small series of patients reveals no significant difference in the percentage of successful grafts in the 2 groups. Of the homografts, 39.4% were successful, and of the nylon prostheses, 43.5% were successful. However, a definite difference between the two is that the late failures in the homograft group were occasionally associated with defects developing in the graft itself, whereas late failures in the nylon group were never the result of inherent defects in the prosthesis. There were 5 complications caused by defects peculiar to homografts (3 ruptures and 2 aneurysms), but there were no such defects with nylon tubes.

Homografts, in general, are less durable than plastic tubes. Nylon, as used in this study, has shown no tendency toward weakness for periods up to 2 years. It seems likely that it will outlast the patient in most cases. The ideal prosthesis has not been developed as yet, but the nylon tubes used in this study have eliminated an important cause of graft failures from defects in the structure of the graft itself. Results of bypass surgery are also improved by careful selection of patients, with insertion of grafts only in the most suitable of them.

The Clinical Use of an Elastic Dacron Prosthesis. D. E. Szilagyi, L. C. France, R. F. Smith and J. G. Whitcomb. A. M. A. Arch. Surg. 77:538-551 (Oct.) 1958 [Chicago].

An arterial substitute woven of plain Dacron yarn in the woof and elasticized (Helanca) Dacron yarn in the warp in the form of straight tubes and bifurcations was used in animal experiments and in 43 clinical cases. The prosthesis is elastic, seamless, smooth-walled, finely porous, light, and soft and has the ability to elongate 15 to 20% without deformity. It is easy to procure, store, and sterilize. This prosthesis comes reasonably close to what is required, having a porosity that is satisfactory both from the point of view of arteriogenesis and from that of hemostasis. In animal experiments with long aortic bypass implants, during 11 months of observation the elastic Dacron prostheses showed an excellent rate of patency, even when traversing a tortuous course. Arteriogenesis around the implants was good, and tissue reactivity was low. During 9 months of implantation the initial tensile strength of the prostheses was essentially unchanged.

In considering the results of 9 months' experience with 43 cases, the prejudicial effect of case selection must be kept in mind, as patients with more advanced and diffuse disease were assigned for treatment with angioplastic procedures utilizing the prosthesis rather than for treatment by homograft. In spite of this, the Dacron prosthesis yielded a patency rate only slightly below that obtained with homografts. In angiographic examinations up to 9 months after operation, there was patency of the arterial substitute in 92% of the aortoiliac area grafts and in 63% of the femoropopliteal area grafts. In experiments on dogs there was some evidence that the new-formed lining of the prosthesis was slow to develop. Since the formation of this pseudointima was greatly influenced by the technique of preclotting (which is largely a matter of personal skill), the evidence in this regard was not entirely convincing. Moreover, in older canine specimens the new intima was always found to be satisfactory.

Another factor to be considered in examining results is the initial lack of full familiarity with the technical behavior of a new device. This study shows that results are better when angiographic visualization of the prosthesis is delayed until the 6th postoperative week.

The advantage of plastic prostheses consists in the promise that their rate of deterioration after longer follow-up periods will be much less than that of homografts. If this is true, the late patency rate of plastic implants will be better than that of homografts, since many more of the early good results will persist. The assumption that this is what will happen is supported by excellent experimental evidence but will not be proved until the prostheses have been observed for much longer periods of time.

Scalene Node Biopsy—Clinical Evaluation and Application. S. W. Shapiro and L. T. Palumbo. Am. J. Surg. 96:511-514 (Oct.) 1958 [New York].

The authors performed scalene node biopsies on 51 patients with pulmonary lesions in the department of surgery of the Veterans Administration Hospital in Des Moines, Iowa, in the course of a 30-month period. Metastatic carcinoma in the scalene nodes was found in 9 (18%) of the 51 patients. Thirty-eight of the 51 patients had proved primary carcinoma of the lung, and biopsy of the scalene nodes revealed metastatic carcinoma in 7 patients (19%); 3 of the 7 patients had scalene nodes involved on the right side, and 4 on the left side. Scalene nodes were clinically palpable in 6 of the 38 patients with primary carcinoma of the lung. In 2 patients with palpable nodes, carcinoma was not found on microscopic studies. Of the 4 patients with positive biopsies of the scalene nodes on the left side, 3 had palpable nodes. Lesions of the upper lobe of the left lung accounted for 2 of these, and the third lesion was a left hilar mass. Of the 3 patients from whom positive scalene node biopsies were obtained on the right side, 1 had clinically palpable nodes, and the primary lesion presented as a right hilar mass. There were 3 patients in whom nodes were not palpable clinically, but metastatic carcinoma was found in the scalene node specimens. In the instances of nonpalpable scalene nodes, the incidence of positive nodes thus was 8.1%.

Of the 38 patients with proved primary carcinoma of the lung, 19 were considered to have operable disease and 19 were considered to have inoperable disease; from 2 (10%) of the 19 patients with operable disease, positive scalene node biopsies were obtained. This factor may be an important consideration in selection of patients for exploration and resectability. Scalene node biopsy is an additional adjunct to the establishment of a diagnosis in many lesions and an important aid in the determination and selection of patients with pulmonary lesions for thoracotomy. A properly performed scalene node biopsy should become a definite part of the over-all examination and evaluation of patients with pulmonary lesions, particularly those with primary carcinoma.

Pulmonary Tuberculosis and Gastric Resection. H. Neubert. Tuberkulosearzt 12:444-447 (July) 1958 (In German) [Stuttgart, Germany].

Interrelations between pulmonary tuberculosis and gastric resection were investigated in an extensive literature survey and in studies carried out by the author. Among 4,348 patients who had undergone gastric resection, 120 (2.7%) with pulmonary tuberculosis were found; and among 23,061 patients with pulmonary tuberculosis, 460 (2%) who had undergone gastric resection were found. During the years from 1955 to 1957 at the sanatorium with which the author is connected, 31 patients who had undergone gastric resection were found among 832 male patients with pulmonary tuberculosis (3.5%) In 25 of these patients the tuberculosis became manifest after the operation, while in 6 patients reactivation of the tuberculous process occurred within 4 weeks to 5 years after gastrectomy. Fourteen of the 31 patients required hospital treatment Pulmonary resection had to be resorted to in patients. In view of the fact that in 4 of these patients serious postoperative complications developed, the author believes that pulmonary resection should be performed in gastrectomized patient only when absolutely necessary. It is suggested tha nutritional and vitamin deficiencies, due to defective intestinal absorption after gastrectomy, impai the defense mechanism of the body and thus create favorable conditions for the development of tuberculosis of the lungs.

Ovariectomy and Adrenalectomy for Treatment o Metastatic Cancer of the Breast. J. B. Davis. Am. Surg. 96:492-495 (Oct.) 1958 [New York].

Of 389 women with metastatic cancer of th breast, whose cases were collected from the literature and who had undergone bilateral ovariectom and adrenalectomy for palliation, 189 (48.7%) obtained a remission with reduction of pain, healing of ulcerated lesions as well as of pathological fractures, reduction in size of tumor masses and pleura and peritoneal effusions, and prolongation of usefu life expectancy. Three patients died, an operative mortality rate of 7.9%. The author performed bilateral ovariectomy and adrenalectomy on 11 women, between the ages of 39 and 56 years, with metastatic cancer of the breast. There was a dramatic remission in 9 patients (82%), with no operative death.

Estrogens have been proved to be carcinogenic and have a decided role in the production and maintenance of many cancers of the breast. It can be seen that removal of the ovaries will rid the body of the primary source of estrogen and removal of the adrenals removes all the remaining supply. Bilateral ovariectomy and adrenalectomy are worthwhile operations in the palliative therapy of disseminated cancer of the breast in that they have a low operative mortality rate and prolong the useful life expectancy of nearly 50% of the patients. At present there is no clear-cut criterion useful in selecting patients for adrenalectomy. It seems apparent that any person afflicted with disseminated cancer of the breast should be considered a candidate for this form of therapy.

Hypophysectomy with Yttrium^{90} Implant. C. A. Gleadhill. Irish J. M. Sc. 6:432-433 (Sept.) 1958 [Dublin].

According to Gleadhill, it is difficult to obtain total pituitary removal by either hypophysectomy or implantation of radioactive material, and so he decided to combine the 2 procedures. The radioactive substance used is 8 to 12 mc. of radio yttrium (Y^{90}) in the form of a fine powder. It is a pure beta-emitter and has a half-life of 68 hours and a penetration of about 1 cm. through tissues. When mixing the Y^{90} powder in the operating room with a self-setting acrylic resin proved unsatisfactory, the author tried mixing the powder with bone wax and later with dental impression wax, and this last method has proved consistently satisfactory. The operation is done through the standard frontal pituitary approach. A small skin flap is turned from just above the glabella to just in front of the ear, the bone is burred and sawn, the lower saw-cut being as close to the floor of the anterior fossa as possible, and the bone is left hinged on the temporal muscle. A thick piece of temporal muscle is removed and put aside for later use. When both nerves and chiasma are well displayed, the pituitary stalk is divided. The points of a long-angled forceps are pushed through the aperture in the diaphragma sellae and opened. With the aid of small curettes and pituitary rongeurs, the pituitary gland is removed piecemeal. When removal is believed complete, the plunger is used to force the wax into the apparently empty fossa. A flat spatula is now used to press it in, so that it is fully in contact with the walls of the fossa, and to smooth the upper surface. The piece of temporal muscle previously removed is now laid over the wax, between it and the optic nerves and chiasma, and Gelfoam is laid over the muscle. Since muscle has been used, no visual complications have occurred.

Transverse Incision in Abdominal Surgery of the Colon and Rectum. H. D. Trimpi. Dis. Colon & Rectum 1:339-344 (Sept.-Oct.) 1958 [Philadelphia].

This report concerns 250 consecutive cases of lesions of the colon and rectum in which transverse abdominal incision was employed. There were 151 patients on whom resections for carcinoma were performed. Resections for diverticulitis numbered 43. There were 32 colostomies accompanied by colonoscopic examination for polyps. The remaining 24 operations were performed for Hirschsprung's disease, villous adenomatous polyps, strictures associated with lymphogranuloma venereum and radiation proctitis, and for the purpose of determining whether there was recurrence of malignancy by "second look" operations. Advantages of the transverse abdominal incision, when employed in surgical procedures for lesions of the rectum and colon, are excellent exposure, diminished depth of the wound and easy access to the entire pelvis, less postoperative discomfort, a stronger wound and lower incidence of dehiscence, evisceration, and incisional herniation. Retention sutures, tight taping, and abdominal binders are not required. Early ambulation and deep breathing are facilitated. There is a shorter period of convalescence, and rehabilitation is possible earlier. The final result is a strong narrow scar, which is least displeasing cosmetically.

Carcinoma of the Breast in Middletown, U. S. A. T. C. Moore, D. R. Judd and W. C. Moore. Surg. Gynec. & Obst. 107:433-441 (Oct.) 1958 [Chicago].

The authors report their experience with 307 consecutive cases of histologically verified carcinoma of the female breast studied during a 16-year period, 1935-1951, at the Ball Memorial Hospital in Muncie, Ind. None of the patients were lost to follow-up, and all living patients have been followed for a minimum of 6 years. The Ball Hospital, during the period of this study, was a general hospital of 250 beds and was the only hospital serving Muncie (the "Middletown" of sociological literature), with a population of 60,000, and Delaware County, with a population of 95,000. It provided care for both private and charity patients. Carcinoma of the breast accounted for approximately 10% of the cases of malignant neoplasm handled at this hospital. Although the ages of the patients ranged from 22 to 90 years, 71% were between 40 and 70 years of age. All but 2 of the 307 patients were seen initially at the hospital. Carcinoma was found in the left breast in 160 of the primary cases and in the right breast in 140. Bilateral mammary involvement was encountered in 5 patients.

The Halsted type of radical mastectomy was carried out in 271 of the 305 primary cases (89%). Simple mastectomy was performed in 31 cases, and biopsy only was undertaken in 3. Simple mastectomy was reserved largely for the more elderly patients. The 2 with secondary disease received treatment for local recurrences. All the patients were operated on by specialists in surgery. One hundred ninety-seven of the patients are known to be dead, and 110 are living. Additional primary carcinomas were discovered in 5 of the patients. The 5-year survival of the total group of 307 patients was 54%. The 5-year survival of the 271 patients managed by radical mastectomy was 55%, while that of the smaller simple mastectomy group was 45%. The presence or absence of axillary nodal metastasis was found to be the most important single factor influencing the survival of the patient. Axillary metastasis was encountered in 52% of the patients managed by radical mastectomy. The 5-year survival in this group of patients was 73% without axillary metastasis and only 31% when axillary involvement could be demonstrated.

Radiation therapy, in amounts ranging from 1,800 to 2,000 r, was given after radical mastectomy to 57 patients. There was no apparent improvement in the 5-year survival of the patients who were found to have no axillary metastasis. However, in the group of 104 patients with axillary metastasis who were managed without postoperative radiation therapy, the 5-year survival was 34% as compared with a 53% survival in the relatively small group of 36 patients with axillary involvement who received postoperative radiation therapy. Greater utilization of postoperative radiation therapy in the currently employed 5,500 to 6,000 r range, especially in patients with axillary nodal metastasis, would appear to be worthy of more extensive trial. Ten-year follow-up was obtained in 100% of 184 consecutive patients. Thirty-three per cent of this group were alive 10 years after operation. Radical mastectomy was carried out in 164 of these patients, with a 44% 10-year survival in patients without axillary metastasis and a 22% survival in patients with axillary nodal involvement. The value of 10-year follow-up studies in assessing the results of management of carcinoma of the breast is emphasized.

Adrenalectomy in Cushing's Syndrome: Management and Metabolic Aspects. A. S. Mason, J. E. Richardson and C. E. King. Lancet 2:649-656 (Sept. 27) 1958 [London].

Adrenalectomy should be undertaken only when the diagnosis of adrenal cortical hyperfunction (Cushing's syndrome) is proved beyond doubt. Difficulty may be encountered in adolescent girls who exhibit obesity, acne, pink striae distensae, menstrual irregularity, and even a slight rise in blood pressure. There may be some increase in the urinary metabolites of hydrocortisone, but the absence of muscle wasting and the presence of generalized obesity help to distinguish this condition from Cushing's syndrome. These patients should not be subjected to adrenalectomy, as the disturbance is transitory and responds to a reducing diet. A similar type of benign transient disturbance is sometimes seen in young men. The adrenogenital syndrome in women is more serious. It arises in puberty and continues throughout life. Such patients are plethoric, hirsute, obese yet muscular, with irregular menstruation and, in later years, benign hypertension. Urinary steroid excretion is increased, but this is mainly in the form of 17-ketosteroids. However disfiguring, the disease is not fatal, and therefore adrenalectomy is seldom justified.

Cushing's syndrome, however, is a progressive fatal disease. Studies are reported on 17 patients in whom Cushing's syndrome was associated with adrenal hyperplasia and on 1 patient in whom it was associated with adrenal carcinoma. Special metabolic studies, including nitrogen and potassium balances, were made before operation in 8 patients and after adrenalectomy in 9. Patients were selected for adrenalectomy only when the diagnosis of Cushing's syndrome was beyond doubt and the disease was definitely progressive. Assessment of rate of progress was based on clinical features, such as hypertension, muscle wasting, and weakness, together with the data obtained from metabolic studies of protein catabolism and electrolyte disturbances. There are at present no adequate methods of restoring protein levels. The electrolyte disturbances must be corrected before operation.

Total adrenalectomy is recommended in younger patients and in those with rapidly progressive disease. In older patients subtotal adrenalectomy is preferred. In younger patients the operation is carried out in 1 stage and in older patients in 2 stages. The most important item in the immediate preparation for surgery is administration of sufficient cortisone to maintain the excessive level of glucocorticoids to which the patient has become accustomed. To ensure absorption over the time of operation and during the postoperative period, the cortisone must be given intramuscularly. Intake of water and sodium must be limited in the immediate postoperative period. The dose of cortisone must be gradually reduced, and later the amount of salt increased. The most serious postoperative complication is acute adrenal failure. It should be treated by giving hydrocortisone hemisuccinate, which should always be available in case of emergency. The other complications are ileus, pulmonary embolism, hemothorax, and pneumothorax.

Lobectomy for Postpneumonic Lung Abscess in Infancy and Childhood. T. C. Moore. Surgery 44:741-751 (Oct.) 1958 [St. Louis].

The author reports on 2 infants, a 7-week-old boy and a 16-month-old girl, and on a 9-year-old girl who were subjected to 4 lobectomies for lung abscess. In the 7-week-old infant emergency lobectomy was necessary because of tension pneumothorax due to communication of the abscess with both the tracheobronchial tree and the pleural space. A second, noncommunicating lung abscess occurred in this infant one month after the first operation and was also successfully managed by lobectomy. In all 3 patients the abscess was postpneumonic, and in all it appeared to be caused by Staphylococcus pyogenes var. aureus. The causative agent was cultured from the respiratory tract in all 3 patients and from the contents of 3 of the 4 abscess cavities. No growth could be obtained from the contents of one cavity after 5 weeks of intensive antibiotic therapy. All the abscess cavities were quite large, and all were lined with granulation and fibrous tissue. A communication with the tracheobronchial tree was observed only in the infant boy. The initial symptoms in all 3 patients were of respiratory tract infection with fever of 2 to 4 weeks' duration before admission to hospital. In none of the patients was there any discharge of purulent material from the tracheobronchial tree before the operation. The lung abscess occurred during the Asian influenza epidemic of late 1957 and early 1958 in the 2 female patients; in both, bilateral pneumonitis had been shown by the chest roentgenograms before the formation of the abscess. The cases of these 2 patients were characterized initially by remissions and exacerbations of respiratory tract infection and attacks of marked hyperpyrexia. Lung abscess, particularly of the postpneumonic type, rarely occurs in infancy and childhood. The 2 infants in whom pulmonary resection for lung abscess was required were the only ones on an active pediatric surgical service during an 11-year period (1947-1958) at the Indiana University Medical Center in Indianapolis.

Digital and Instrumental Commissurotomy in Mitral Stenosis: A Study of 2,000 Cases. A. M. Dogliotti, A. Actis-Dato and R. Gentilli. Surgery 44:706-717 (Oct.) 1958 [St. Louis].

The authors report on 2,000 patients who underwent mitral commissurotomy at the clinic for cardiac surgery of the University in Turin, Italy, between 1951 and 1957. Of the 2,000 patients, 987 were operated on by digital splitting only of the commissures; in 556 patients both commissures yielded, in 413 only the anterior yielded, and in 18 only the posterior did. Instrumental commissurotomy only was performed on 396 patients; in 112 patients both commissures were incised; in 248 only the anterior, and in 36 only the posterior. A combined technique was used in the remaining 617 patients; in 395 of them finger fracture and instrumental valvulotomy was applied to both commissures, while in the other 222 one commissure was split by digital fracture only and the other by instrumental valvulotomy only. In general, the anterior commissure was the most frequently divided, whether by finger fracture or by instrumental incision.

In the first 1,000 patients operated on, the enlargement of the mitral orifice obtained by the intervention was smaller than in the next 1,000 patients operated on. With more knowledge of the pathological anatomy of the mitral valve and more experience with the techniques of commissurotomy, greater enlargement of the mitral orifice was obtained. The greater the enlargement, the better was the functional result. Therefore, the authors attempted to enlarge the mitral orifice to a surface size as near to normal as possible. Minimal or moderate mitral insufficiency was recognized at the time of digital exploration of the mitral valve in 276 patients; it remained unchanged postoperatively in most of them; it diminished or disappeared in 29, and it increased in 53. In 36 patients an insufficiency of variable degree was created. Lacerations including the whole atrial wall occurred in 3 patients, and lacerations limited to the point of insertion of the left auricular appendage into the left auricle occurred in 54. All the lacerations, except 2, occurred during digital splitting maneuvers. There were 61 operative deaths (3.05%); of the 61 deaths, 20 (4%) occurred among the first 500 patients, 19 (3.8%) among the second 500, 15 (3%) among the third 500, and 7 (1.4%) among the fourth 500 patients operated on. Of 1,210 patients with elastic valves, death occurred in 30 (2.48%). Of 335 patients with calcified valves, death occurred in 19 (5.67%). Of 455 patients with sclerotic valves, death occurred in 12 (2.87%). Thus, the over-all mortality was lowest in the group of patients with elastic valves and highest in those with calcified valves.

The results obtained with instrumental commissurotomy, either as the sole technique or associated with digital pressure, were definitely better than those obtained with the single finger fracture technique because of the better functional mobility obtained and also because of the lower incidence of complications. There were no particular differences in the mortality rate according to the techniques employed; the mortality seemed to be more related to the anatomic condition of the stenotic valve. Instrumental valvulotomy is not always necessary, but it is suggested in the presence of sclerotic commissures resistant to digital pressure and extensive calcifications of the commissures. It is a safe procedure. For restoration of maximal cusp mobility one should attempt to extend the incision of the commissure up to the optimal limit which is represented by the fibrous ring. The Dogliotti valvulotome proved to be the simplest instrument and the easiest to handle.

Use of Nylon Bifurcation Grafts in Arteriosclerosis. L. D. Hill, G. H. Lawrence and L. Annest. West. J. Surg. 66:276-281 (Sept.-Oct.) 1958 [Portland].

One of the most effective methods of treating aneurysms or obliterative arteritis of arteriosclerotic origin affecting the abdominal aorta and its bifurcation is either the resection of the diseased segment and its replacement by a bifurcation graft or a complete bypass of the obstruction by a graft. Attempts have been made to overcome the difficulty of obtaining and preparing satisfactory homologous arterial grafts by the use of various synthetic materials. One of the most recent and, in the authors' experience, most satisfactory types of grafts has been the Edwards-Tapp nylon graft. This is a braided nylon, Silicone-treated, bifurcation graft which is seamless and has crimped tubing to prevent wrinkling in the iliac branches. The seamless construction does away with the possibility both of leakage through a broken-down seam and of thrombosis in the seams in the smaller branches. Branches of crimped tubing can be bent to form a side-to-end anastomosis without kinking, and in grafts below the inguinal ligament, the crimping prevents thrombosis from occurring when the hip is bent. One disadvantage of the nylon graft, on the other hand, is the fact that it is porous and begins to leak as soon as the clamps are released from the aorta. This disadvantage can be offset, however, and the blood loss can be minimized if the graft is preclotted before it is put in place. Another slight disadvantage is the fact that the ends of the nylon graft must be cauterized in order to keep them from fraying when they are sewed in place. Even after being cauterized, the graft tends to fray at the end unless it is handled very carefully.

Failure of the graft itself did not occur in any of the 20 patients in the authors' series, 12 of whom had occlusive disease and the other 8, aneurysms. One of the patients with occlusive disease died, 9 had excellent results, and in 2 claudication, though not eliminated, was considerably lessened. Two patients had ruptured aneurysms. One recovered and is now working at his previous job without symptoms, although he suffered a myocardial infarction during the postoperative period. The second patient underwent a successful resection and graft of the ruptured vessel, but thrombosis of the right posterior tibial artery appeared and made it necessary to perform an arteriotomy on the first postoperative day. This procedure was also successful, but on the 7th postoperative day the patient died of a pulmonary embolism. One other patient, who was operated on for an aneurysm, died 8 months after the original operation when a second intervention became necessary because of a leak in the proximal anastomosis. It is true this represented failure of a suture line, but it did not represent failure of the graft, because it appeared that the aorta had become necrotic proximal to the anastomosis. Follow-up of the surviving patients with aneurysms showed them to be in good health and without symptoms referable to the arterial tree.

The Effects of Hypophysectomy on Intellectual Functioning. M. Schon. J. Ment. Sc. 103:743-748 (July) 1958 [London].

When hypophysectomy was first employed, it was speculated that patients undergoing this type of surgery might become intellectually so deteriorated that the benefit of the prolongation of the life span might be offset by the possible mental incapacity. In addition, most of the patients who were faced with this type of surgery raised the question as to the possibility of mental deterioration after hypophysectomy. These considerations gave impetus to the present study. Hypophysectomy involves 2 variables: brain surgery, and the elimination of the major source of endocrine stimulation and hormone production. On the basis of literature reports, it was hypothesized that hypophysectomy will not effect any significant changes in intellectual functioning, nor that it will result in brain damage.

Twenty women, ranging in age from 40 to 66 years, who had metastatic malignant breast tumors suspected to be dependent upon endocrine gland factors were studied before and after hypophysectomy. All the patients were tested with the Wechsler-Bellevue Intelligence Scale preoperatively and 6 to 10 weeks postoperatively. The Wechsler-Bellevue Intelligence Scale consists of a verbal scale and a performance scale. No statistically significant change in general intellectual functioning and no brain damage, as measured by the tests, could be noted after hypophysectomy. Thus, the hypothesis was confirmed. There was an increase in accuracy, possibly as a result of postoperative improvement in health or due to the practice effect involved in retesting, and a decrease of speed, probably related to a secondary hypothyroidism because of a deficiency of pituitary hormones.

Congenital Cystic Dilatation of the Common Bile Duct: Special Reference to Radiographic Studies. M. M. Ravitch and G. B. Snyder. Surgery 44:752-765 (Oct.) 1958 [St. Louis].

The authors report 3 cases of choledochal cyst, or congenital cystic dilatation of the common bile duct, in a 3½-month-old female infant and in 2 girls, aged 5 and 13 years respectively. The infant had jaundice since the third week of life and a huge choledochal cyst, for which she was successfully treated by a Roux-Y anastomosis of cyst and jejunum. The 5-year-old girl, with attacks of pain, jaundice, and a palpable mass in the right upper quadrant of the abdomen, had a largely retroduodenal cyst, which was anastomosed to the duodenum with relief of symptoms. In the 13-year-old girl with repeated attacks of violent epigastric pain but without a palpable mass or jaundice, the choledochal cyst was shown preoperatively by an oral cholecystogram, and an intravenous cholangiogram made before the operation confirmed the findings of the cholecystogram. At surgical intervention the cyst was demonstrated clearly by 10 cc. of a 50% solution of diatrizoate (Hypaque) sodium injected into the gallbladder. Two additional injections of 10 cc. and 5 cc. of the contrast medium showed the hepatic and common ducts and also the pancreatic duct. The last injection of the contrast medium was discontinued when resistance was noted, and the gallbladder was seen to be tense for the first time. A precipitous fall occurred in the patient's arterial pressure from 110 to 50 mm. Hg, but withdrawal of 20 cc. of thin bile-colored fluid from the cyst resulted in immediate restoration of normal arterial pressure. A cystoduodenostomy gave relief, but clinical pancreatitis resulted from the injection of the contrast medium in an attack simulating the preoperative attacks. The patient's subsequent course was smooth, and she has remained well for 5 postoperative months.

The diagnosis of choledochal cyst can usually be made on the clinical grounds of recurrent pain and jaundice and a palpable abdominal mass and can occasionally be confirmed by preoperative roentgenographic studies. The diagnosis may be made with absolute precision at surgical intervention by the injection of contrast medium into the gallbladder. The nature and cause of the anomaly remain uncertain. The facts that jaundice eventually supervenes, even though characteristically intermittent, and that dilatation of the hepatic ducts was observed in all 3 patients and was described in other cases collected from the literature indicate an obstructive element. The acute pancreatitis, which was inadvertently produced in the third patient by retrograde injection of the contrast medium under pressure, precisely duplicating her preoperative attacks of pain, made it obvious that injections of contrast medium into the cyst in these patients should be done under gravity with little or no pressure. The small, or largely retroduodenal, cyst should be treated by direct anastomosis between the duodenum and the cyst, and the larger cyst by a Roux-Y anastomosis to the jejunum.

Carcinomatous Degeneration of Pilonidal Cysts: Report of a Case. J. G. Matt. Dis. Colon & Rectum 1:353-355 (Sept.-Oct.) 1958 [Philadelphia].

In an 18-year-old youth who complained of pain and bleeding from the rectum, several pinpoint openings were discovered over the sacrococcygeal junction. A diagnosis of pilonidal cyst with perirectal fistula was made, and the cyst and its ramifications were excised and the wound marsupialized. The pathologist diagnosed a mixed basal-cell and squamous-cell carcinoma of the perianal skin and of the pilonidal sinus tract. One month later, the entire scar and the granulating area were excised en bloc, including a generous cuff of normal tissue on all sides and extending down to the periosteum and the gluteus maximus muscle and into the ischiorectal fat. Marsupialization of the wound was again performed. *Microscopic examination of the specimen revealed no evidence of neoplasia.*

The author considers it remarkable that a lesion as common as pilonidal cyst (which, moreover, may be the result of embryologic vagary or of cicatrix formation [both have been mentioned as precursors of malignancy]) should become involved by malignant degeneration so infrequently. It was suggested by Hall and Lee that failure to detect cancer more often in specimens of pilonidal disease may be owing to inadequate microscopic examination. The author believes that *pilonidal disease, with chronic* drainage or recurrent acute inflammation, requires a surgical procedure that will completely eradicate all involved tissue and that this tissue should be submitted to a histological examination.

The Surgical Patient: Oral Bouillon Feedings. H. B. Benjamin, M. Wagner, N. L. Bugarin and G. Bartenbach. J. Internat. Coll. Surgeons 30:405-411 (Oct.) 1958 [Chicago].

It is now common practice to use the vascular system for alimentation during the postoperative period. To maintain the surgical patient in the ideal state of protein and electrolyte balance requires a great deal of cooperative work among the surgeon, the nurses, and the laboratory staff. If any one of the persons concerned with this program fails to meet his or her obligation, or if a bottle of urine or material obtained by gastric suction is spilled, the entire venture fails. Add to this the great financial burden placed on the patient, and the result is a cumbersome program of scant value to the patient. The numerous phlebotomies and the intravenous administration of massive quantities of fluids was presented by Bailey as the cause of many so-called undiagnosed, or falsely diagnosed, deaths that have been ascribed to the surgical procedure but that are actually due to air emboli. The intravenous infusion of nutritional fluids does not guarantee that the body has accepted and utilized them. Far more stress is placed on keeping the patient in electrolyte and nitrogen balance by intravenous infusions after an operation than is necessary or advisable.

A simple approach would be to administer orally some liquid form of food that would be well tolerated and appetizing and would supply the electrolyte and protein needs of the patient. Beef bouillon broth was selected as being the substance most aptly filling these requirements. Several types of bouillon cubes were tested, and the one selected contained 26.2% of protein, 6.6% of fat, and 10.3% of other organic matter. Two cubes were dissolved in 300 cc. of hot water, and this was given to the patient every 3 hours, starting on the first postoperative day. This broth was well tolerated and induced and increased the appetites of patients; at the same time, the hot fluid encouraged intestinal *peristalsis. A comparative study* was made on patients, most of whom had undergone total or partial gastric resection. Their ages ranged from 30 to 75 years. Blood was drawn on the day the patient entered the hospital for chemical tests; this supplied preoperative blood levels for comparison. Bouillon broth was ordered on the first postoperative day and successive days until the patient was ready for discharge from the hospital. By comparison with patients who received electrolyte therapy parenterally, the administration of bouillon by mouth provided and maintained the same, or better, electrolyte and protein blood levels as did the electrolyte parenteral program. It is not meant to imply that the bouillon feedings are the answer to all problems of postoperative nutrition, but in the opinion of these authors they have several advantages over intravenous feeding and can be a simple and inexpensive approach to a great many nutritional problems of postoperative care.

GYNECOLOGY & OBSTETRICS

Pregnancy After Pneumonectomy for Pulmonary Tuberculosis: Analysis of a Collected Series of Seventy-four Pregnancies in the Netherlands. C. D. Laros. Am. Rev. Tuberc. 78:563-569 (Oct.) 1958 [New York].

Young women who have undergone pneumonectomy often ask their physicians, "Is it sensible to marry, and is there any objection to having children?" To obtain some insight into this problem, a survey was made of the frequency and course of pregnancy in female patients after pneumonectomy for pulmonary tuberculosis. Inquiry produced data on 64 patients from all parts of The Netherlands who had a total of 74 pregnancies. Generally speaking, no adverse effects of the operation for either the mother or the child were seen during pregnancy and labor.

Topical Androgenic Hormones in Vulvar Kraurosis-Leukoplakia Syndrome: Preliminary Report. A. C. Richardson and G. A. Williams. Am. J. Obst. & Gynec. 76:791-799 (Oct.) 1958 [St. Louis].

The authors present a preliminary report on 25 women, their ages ranging from 25 to 89 years, with kraurosis and/or leukoplakia of the vulva, who have been treated primarily with topical testosterone propionate in sesame oil in a petrolatum base. Three patients were referred from charity clinics, and the remaining 22 were private patients. Twenty-four of the 25 patients were, or had been, married and, of these, 19 were parous. Nineteen of the patients had had previous treatment, but in none of them had the disease been satisfactorily controlled. Two patients had had previous vulvectomies, one for carcinoma of the vulva and the other for leukoplakia of the vulva. Both of these had postoperative recurrence of leukoplakia with pruritus. Fifteen of the 25 patients had primary atrophy (kraurosis), 4 had leukoplakia, and 6 had primary atrophy with leukoplakia. Patients who presented a severe inflammatory reaction of the vulva with intense pruritus were initially treated with 0.1% fluorocortisone acetate ointment as a anti-inflammatory agent. Its use was discontinue as soon as the inflammatory reaction improved The patients were then instructed to apply to the vulva the testosterone propionate–oil preparation 10 cc. of which (50 mg. of testosterone propionat per cubic centimeter) was combined with 10 Gm of white petrolatum. Oral or parenteral therap with estrogen was not prescribed. No lesions wer excised except for biopsy; no surgery was done fo contracture of the introitus. Four patients had incision of a vaginal phimotic foreskin under loca anesthesia. All 25 patients were followed for sufficient period, varying from 3 months to 6½ years, to judge the efficacy of the treatment. On of the 25 patients has been lost to recent follow-up, but the remaining 24 are still under observation.

All 25 patients received satisfactory symptomatic relief of their pruritus and irritation within 1 to 6 weeks, accompanied by healing of abrasions and fissures. Grossly leukoplakic plaques regressed, although some required several months. All patients had a return of symptoms and progression of the disease within 1 to 6 months after omission of the testosterone ointment. Continued therapy thus has been required. None of the patients showed evidence of hirsutism, voice changes, or acne, even after prolonged therapy. All had some hypertrophy of the clitoris, which persisted and prevented the recurrence of phimosis. Depigmented areas of the vulvar skin were not observed to have a return of pigment. There has been no allergy due to the medication. Several of the patients developed an intertriginous dermatitis of the vulva during the early weeks of therapy. This disappeared under symptomatic treatment and did not recur with continued use of the testosterone ointment. Satisfactory relief of symptoms, without recourse to surgery, and apparent arrest of the disease process have been accomplished with this method of treatment.

The Possible Role of Smegma in Carcinoma of the Cervix. H. C. Heins Jr., E. J. Dennis and H. R. Pratt-Thomas. Am. J. Obst. & Gynec. 76:726-735 (Oct.) 1958 [St. Louis].

The authors performed experiments on mice into whose cervices and upper vaginas raw human smegma, obtained by retraction of the foreskin and evacuation of this material from about the glans in uncircumcised male inmates at the South Carolina State Hospital in Columbia, was applied repeatedly by 2 basic methods; these methods were by means of a metal speculum and by the injection of a single "dose" into the vagina followed by closure of the vaginal orifice with sutures. Biweekly vaginal injections of culture of 100% Mycrobacterium smegmatis and biweekly injections of 100% Myco. smegmatis in culture with 5% cholesterol also were performed on mice. Of 88 mice used for the injection of raw smegma followed by vaginal ligation, epidermoid carcinoma occurred in 8 (10%) and marked hyperplastic changes in 22 (25%). Thus, there were significant changes in 35% of the animals. These results show that carcinoma of the cervix can be produced by human smegma if the stimulus is continued for 14 months or more. Whole smegma, as well as some of its components, is stimulatory to the cervicovaginal epithelium of mice, and invasive carcinoma will eventuate if the stimulus exists. Whole raw smegma has proved to be the most effective stimulus in these experiments. The objections to the use of lower animals in reference to human cancer are obvious. A similar study with the use of an experimental animal of primate level is contemplated.

The Origin of Fetal Malformations: The Case of a Rare Monster. F. De Gennaro. Minerva ginec. 10:543-551 (July 31) 1958 (In Italian) [Turin, Italy].

A woman, 38 years of age, was delivered of a stillborn monster at the 7th month of pregnancy, after previously having had 3 normal children. The history of the parents revealed nothing unusual, except that the mother was underfed during pregnancy. The newborn infant had normal extremities, mouth, and ears but a short neck and no nape. A large eyeball with 2 pupils was set in a cavity in the middle of the upper third of the face. A small fleshy protrusion, 2.5 cm. (1 in.) in size, rose just above the eye cavity. Behind the protrusion, a large, dark, vesicular mass replaced the skull and extended over the posterior part of the neck. The ribs showed defective development and absence or fusion of parts. The skull had the frontal bone, but the ethmoid, vomer, inferior nasal conchae, lacrimals, and nasal bones were absent. The encephalon was not divided into hemispheres but consisted of a single vesicle.

Surgical and Radiologic Treatment of Cancer of the Cervix in 397 Cases. H. C. Frick II, J. A. Corscaden, H. W. Jacox and H. C. Taylor Jr. Surg. Gynec. & Obst. 107:457-468 (Oct.) 1958 [Chicago].

After 1944 radical surgery was reintroduced into the program for treatment of cancer of the cervix in the hope that its use in appropriate instances would increase the number of cures. This report is concerned with 397 patients who were admitted with a diagnosis of carcinoma of the cervix to 2 New York hospitals, the Sloane Hospital for Women, from 1944 to 1951 inclusive, and the Francis Delafield Hospital, for the single year, 1951. It follows previous reports of end-results in cancer of the cervix from the Columbia-Presbyterian Medical Center, the most recent prior publication being for the years 1939-1943. The 5-year end-results in 368 patients treated for cancer of the cervix during the years 1946-1951 are discussed. These included 118 patients with stage 1, 96 with stage 2, 70 with stage 3, and 19 with stage 4, as well as 32 patients with cancer of the cervical stump and 33 with recurrence of previously treated cancer.

In the 1946-1951 series, 232 patients were treated by radiation and 71 underwent surgery among the 303 patients with primary lesions of the cervix, exclusive of the cervical stump. The relative 5-year cure rate for all primary cases was 42.6%. [The relative 5-year cure rate for the 1939-1943 series, when all the patients were treated by radiation, was 43%.] The 5-year cure rate for stages 1 and 2, when surgery was the primary mode of therapy, was 86.5 and 42.1% respectively. Similar figures for those treated by intracavitary and interstitial radiation were 56 and 44.1% respectively. The 5-year cure rate for patients in stage 2 treated by interstitial implantation of radium was 50%. It was noted that there were somewhat earlier cases in the surgical series, somewhat fewer patients with severe constitutional disease, and a much smaller percentage in whom follow-up examination was incomplete.

The authors conclude that surgical treatment in stage 1 cases yielded a higher 5-year survival rate than did radiation therapy. Various factors, particularly of case selection, made the two series not wholly comparable and leave the question of the absolute superiority of one method of treatment over the other unanswered. The application of radical surgical methods of treatment to 76 (22%) of 335 cases of primary cervical cancer has been associated with a slight, but statistically not significant, improvement in the total cure rate.

The Incidence of Spontaneous Cure of Secondary Amenorrhea and Oligohypomenorrhea. A. Westman. Acta obst. et gynec. scandinav. 37:261-269 (No. 3) 1958 (In English) [Stockholm].

In order to investigate the incidence of spontaneous cure of secondary amenorrhea and oligomenorrhea, the author studied 2,262 pregnant women, their ages ranging from 19 to 40 years, who were admitted to the antenatal clinic of the Karolinska Sjukhuset in Stockholm during the year 1956-1957. About 60% of these patients had previously been pregnant. The fact that each patient was pregnant was proof-positive of normal ovarian function, i. e., that a previous disturbance, if it had been present, had been cured. Each patient was given a questionnaire in which she was requested to give information about her previous menstrual history. In 173 (7.7%) of these patients there was a history of amenorrhea and/or oligomenorrhea. Of the 173 patients, 85 gave information about the possible causative factors; it appeared that environmental conditions, place of residence or working conditions, and nervous troubles played an important part in those patients in whom the menstrual disturbance had been of short duration. Most of the menstrual disturbances of more than 12 months' duration had come on after childbirth. A critical analysis of these cases has suggested that spontaneous cure occurs in about 80% of the cases, including those in which the duration of the menstrual disturbance has been up to 3 years. According to the literature, hormone therapy is effective in 50% of the cases. However, the value of this treatment appears to have been overestimated; the true percentage of cases in which it results in cure probably is 20%.

Maternal Death Due to Pulmonary Embolism by Amniotic Fluid. F. A. Carone and J.-G. Regueiro Castro. West Virginia M. J. 54:384-390 (Oct.) 1958 [Charleston].

The case reported is that of a 41-year-old woman, gravida 2, para 1, who was admitted on Jan. 10 at 1:30 p. m., the estimated date of confinement being Jan. 9. When first examined, the patient was thought to be in early labor, with irregular contractions. The fetal head was approximately 2 cm. above the ischial spines, and the cervix was 2 cm. dilated. During the first hour after admission, the labor progressed rapidly and by 3:15 p. m. the cervix was 6 cm. dilated. Demerol was given to ease pain. At 3:30 p. m the patient began to cough and to gasp for air. Within a few seconds she experienced extreme air hunger, stopped breathing, and had a convulsive episode. The blood pressure and pulse were not obtainable. An airway was established, and oxygen was administered. Tracheotomy was begun, but when it became obvious that death had occurred, the operation was not completed. The baby was delivered vaginally with forceps approximately 15 minutes after the mother's death, and, after the usual resuscitative measures, its respiration became established.

On autopsy, significant microscopic lesions were found in the heart, lungs, and uterus of the mother. Foreign material, consisting of squamous cells, mucin, bile pigment, and fat, was found in the pulmonary vessels. Squamous cells, hair, and strands of mucin with clusters of leukocytes were demonstrated in both smears and cell-block preparations of blood from the right heart. The concentration of amniotic particulate matter in right heart blood may have been greater in this case since death occurred in less than 5 minutes, presumably due to massive embolism. Since the particulate constitutents of amniotic fluid have a lower specific gravity then the cellular elements of blood, they settle out as a flocculent layer above the leukocytic cream. Thus, the presence of 3 strata instead of 2 in centrifuged blood from the right heart should be considered pathognomonic for this condition. This procedure may be utilized to establish the diagnosis of amniotic fluid embolism in cases lacking autopsy permission. It is probable that many maternal deaths, without autopsies and labeled thrombotic pulmonary embolism, obstetric shock, or postpartum hemorrhage, actually are fatalities due to amniotic fluid embolism. Some of the deaths which have resulted from amniotic fluid embolism could have been prevented if the proper measures had been instituted. Embolization of the lungs should be considered likely if unexplained cyanosis and shock develop during labor, and oxygen should be administered at once. Papaverine hydrochloride may be given to abolish reflex vascular spasm of the pulmonary vessels and thus prevent pulmonary edema, and atropine or atropine-like agents may be given to abolish cardiac depressor reflexes from the lungs.

When pulmonary edema develops, it should be treated vigorously, and withdrawal of blood may be indicated. Unfortunately, the two measures commonly used to combat shock, i. e., blood transfusion and administration of epinephrine-like compounds, worsen pulmonary edema. Clinical judgment is important in using these agents in patients with amniotic fluid embolism. If death does not occur, attention should be directed to the possible onset of hemorrhagic tendencies because of coagulation defects secondary to infusion of amniotic fluid constituents into the maternal circulation. Incoagulibility of the blood may result and intravascular coagulation may produce hypofibrinogenemia. If this condition exists, it should be corrected by administration of adequate amounts of fibrinogen.

Kyphoscoliosis and Pregnancy. R. Marchand. Laval méd. 26:309-315 (Oct.) 1958 (In French) [Quebec].

Pregnancy in patients with extensive malformation of the vertebral column usually leads to complications of an unsuspected gravity. Few obstetricians know the danger of cardiopulmonary failure in pregnant women with kyphoscoliosis. The influence of deviations of the spinal column varies greatly according to the seat, form, size, and age at onset of the condition. This study is of patients in whom kyphosis or extensive kyphoscoliosis appeared at an early age. This disease produces a marked vertical compression of the thoracic cage with considerable diminution of the respiratory capacity. The resulting interference with pulmonary circulation brings on hypertrophy of the right heart and later lesions of the myocardium. These patients, who are poor risks for general anesthesia and major surgery, tolerate pregnancy with difficulty. The increase in the volume of the abdomen adds to the intrathoracic compression and restrains the respiratory capacity, which is already diminished by the rigidity of the rib cage. The heart must use more strength to overcome this new resistance and circulatory overloading. Delivery requires a physical effort which may be fatal, especially considering the fact that kyphoscoliosis is frequently accompanied by abnormalities of the pelvis. These may make natural delivery impossible, and it is often necessary to terminate the pregnancy by cesarean section.

The author discusses the cases of 3 patients. The first, a primipara aged 30 years, had pronounced thoracic kyphoscoliosis which had begun at the age of 11. On admission to the hospital, she had incipient toxemia of pregnancy, edema of the legs, albuminuria of 3 Gm., and a light hypertension of 140/90. The pelvis seemed a little asymetrical and the external diameters slightly diminished, but the upper passage seemed permeable. Labor was artificially induced 2 weeks before term, and natural delivery was seen to be impossible. Five days later a healthy baby was delivered by classic cesarean section. Six days after delivery the patient died of asystole and infection of the right lung. In the second case a woman, aged 38 years, who had had kyphoscoliosis since the age of 4, died of cardiopulmonary failure 13 days after a cesarean section; until then the condition had had no serious consequences. In the third case a woman of 34, with pronounced kyphoscoliosis of the thoracic spine, dyspnea, and rales but whose myocardium was apparently healthy, was treated with digoxin 5 days before surgery. The fetus was premature and cyanosed and died 24 hours after delivery; autopsy revealed pulmonary atelectasis and a hyaline membrane. The mother, who continued to receive cardiac medication several days after delivery, suffered no severe postoperative symptoms.

Pregnant kyphoscoliotic patients should not be treated with medicines and interventions capable of interfering with pulmonary ventilation and the circulation of the blood. The coexistence of a large deformation of the thoracic spine with pregnancy constitutes an immediate danger for the mother and child and poses a difficult problem for the obstetrician, as shown by the deaths of two of these mothers and one of the babies.

Cystadenocarcinoma of the Ovary and Uterine Pregnancy. C. Chávez and P. Chávez. Arch. peruanos pat. y clín. 12:191-195 (June) 1958 (In Spanish) [Lima, Peru].

Uterine pregnancy which is complicated by either benign or malignant cystadenoma of the ovaries occurs with moderate frequency. According to the literature, the tumor does not interfere with pregnancy, nor does it damage the fetus. Yet the death rate among fetuses in pregnancies associated with ovarian tumors is high (18%). A tripara woman at full term was hospitalized with an enormous abdomen from ascites and with edema from the abdomen to the ankles. A plain roentgenogram of the abdomen confirmed the presence of the fetal skeleton. A diagnosis of polyhydramnios with a living fetus was made. Four days after hospitalization the woman gave birth spontaneously to an infant who was cyanotic and died a few hours after birth. Autopsy showed marked dilatation of the cerebral ventricles, which seemed to have been the cause of death. The mother developed pleurisy during the puerperium, which was controlled by the administration of antibiotics. Two abdominal paracenteses, by which 5,000 and 7,000 cc., respectively, of ascitic fluid were drawn off, were made 2 weeks after parturition. An enormous ovarian tumor was palpated after the paracenteses. The operation consisted of bilateral oophorectomy and removal of the tumor, which was fixed by adhesions to the anterior wall of the abdomen and by a large base to the posterior wall. There were no metastases, but histological study of the tumor showed it to be a cystadenocarcinoma. The postoperative period was uneventful. The patient was given blood transfusions and antibiotics and one week later, after edema had disappeared, was discharged from the hospital. Examination 3 years after the operation has shown that her condition is satisfactory.

Pre-Natal Fetal Electrocardiography. P. Bergman and P. Hall. Acta obst. et gynec. scandinav. 37:348-357 (No. 3) 1958 (In English) [Stockholm].

The authors report a study on 449 prenatal fetal electrocardiograms obtained from 368 patients in the department of obstetrics and gynecology of the general hospital in Malmö, Sweden. Of the 449 electrocardiograms, 277 (obtained from 239 patients whose pregnancy terminated in normal delivery or legal abortion) were taken during the 15th week of pregnancy or later. Detailed data concerning these 277 electrocardiograms showed that prenatal fetal electrocardiography was useful in investigating obstetric cases in which no fetal heart sounds could be heard and in which there was reason to suspect fetal death. In 6 of 28 such patients the electrocardiogram was positive, i. e., it showed measurable, or immeasurable but nevertheless distinct, potentials in 5 consecutive fetal complexes and therefore objective signs of a living fetus; 4 of these women were later delivered of living infants. The first electrocardiograms obtained from the remaining 2 patients gave a positive result, which was subsequently verified when normal fetal sounds were heard. Electrocardiograms taken on later occasions, however, contained no fetal complexes, and the fetuses which were subsequently delivered of these patients were macerated. Since the electrocardiogram was not always positive even when the fetus was alive, a negative record might be less informative.

Prenatal fetal electrocardiography is also a useful guide in the evaluation of the position of the fetus, but with the technique applied in the present investigation the method proved less satisfactory in the diagnosis of twin pregnancies. The amplitude of the QRS complex increases during the last 2 months of pregnancy to reach a maximum at term. If pregnancy proceeds beyond the calculated term, this complex seems to decrease in amplitude. It, therefore, appears that prenatal fetal electrocardiography might be useful in the detection of true postmaturity if serial examinations are made.

PEDIATRICS

Bacterial Endocarditis in Children with Heart Disease. J. G. Cutler, P. A. Ongley, H. Shwachman and others. *Pediatrics* 22:706-714 (Oct., Part 1) 1958 [Springfield, Ill.].

The authors report on 12 boys and 12 girls, between the ages of 8 months and 16 years, with bacterial endocarditis and with preexisting congenital or rheumatic heart disease, who were admitted to the Children's Hospital and the House of the Good Samaritan in Boston between 1944 and 1956. In the group of 6 patients with congenital heart disease of cyanotic type, bacterial endocarditis occurred most commonly in those with tetralogy of Fallot, since 5 of the 6 patients had this congenital defect. In the group of 9 patients with congenital heart disease of acyanotic type, there was a slight predominance of those with ventricular septal defect and coarctation of the aorta. In the group of 9 patients with rheumatic heart disease, mitral insufficiency was the predominant lesion.

The duration of symptoms attributable to bacterial endocarditis before admission to hospital varied from 5 days to 9 months. Twenty-two of the 24 patients were admitted with a history of fever, which subsided when therapy was instituted. Anorexia with associated weight loss was present in 20 patients. Joint pains occurred in 9 patients, and clubbing in 10. Murmurs were noted in all patients. Twenty patients had cardiac hypertrophy, which was progressive since the onset of endocarditis in 10 patients with congestive heart failure. In 12 patients embolism occurred, most frequently in the lungs or brain. Petechiae were observed in 12 patients. Enlargement of the liver was present in 8 patients, and enlargement of the spleen in 16. There was poor dental hygiene with multiple caries in 11 patients. The causative relationship between this physical finding and bacterial endocarditis warrants repeated emphasis. A significant anemia of either normochromic or hypochromic type was present in 19 patients.

Alpha-hemolytic streptococci were isolated from 13 patients, including 7 of the 15 with congenital heart disease and 6 of the 8 with rheumatic heart disease. Three of these 13 patients died. In 2 patients, 1 of whom died, Staphylococcus pyogenes var. aureus was the offending agent. Pneumococci, beta and gamma streptococci, hemophilus parainfluenzae, and Pseudomonas organisms were detected in the remaining patients. Twenty patients (83%) recovered from the acute illness. Antibiotics were used in 23 of the 24 patients. Aqueous salts of penicillin were considered to be the drugs of choice in the treatment of all streptococcic infections. Because of the gravity of the infection, a minimum duration of 3½ weeks of treatment was adhered to. The parenteral route of administration seemed to assure more predictable and uniform concentrations of penicillin in the blood than the oral route. The measure of in vitro sensitivity of the offending organism was used as a guide in the selection of antibiotic agents in nonstreptococcic infections. The prognosis depends on the interval between the onset of illness and the institution of therapy, the sensitivity of the infecting organism to the antibiotics used, adequate dosage of the antibiotics, the severity of the underlying heart disease, and the development of complicating factors, such as congestive heart failure or embolism in vital organs, which are bad prognostic signs despite effective antibiotic therapy.

Salmonellosis in a Premature Nursery Unaccompanied by Diarrheal Disease. J. Watt, M. E. Wegman, O. W. Brown and others. *Pediatrics* 22:689-705 (Oct., Part 1) 1958 [Springfield, Ill.].

The authors report on an epidemic of salmonellosis which occurred in the premature unit of the Charity Hospital of Louisiana in New Orleans. The introduction into this large nursery of 6 apparently healthy premature infants, who were later found to be infected with Salmonella tennessee, led to an epidemic spread of the infection over a 4-month period. None of the 6 infants whose initial rectal swabs yielded Sal. tennessee, a potential pathogen, and none of the 28 additional infants whose cultures became positive after initial spread of the Salmonella infection in this nursery had taken place were clinically ill at any time. Of 130 positive Salmonella cultures which were obtained from the 34 infants, 104 (80%) were found to be positive without the aid of enrichment technique. Six of the 34 infants known to have been excreting Sal. tennessee would have escaped detection if enrichment mediums had not been used.

The original source of the infection could not be determined. Feedings, contact with other patients, and infected animals could be eliminated as modes of spread. Rectal-swab cultures of nurses and attendants were all negative. Infection of air was revealed by obtaining Sal. tennessee from one of 30 swab samples taken of air-conditioning filters. Positive Salmonella cultures were obtained from bedside tables and recently changed cribs. A positive culture was obtained from the hands of one nurse immediately after washing. Evidence was found that increase in the spread of the infection was associated with decrease in amount of nursing care. It is inferred that defective nursing techniques, particularly hand washing, were the chief mode of spread. This outbreak was unique in that an identifiable member of a frequently pathogenic group caused infection but not illness. In similar outbreaks, thorough hand washing should be emphasized as an important and efficient barrier between infected and noninfected infants.

Contribution to the Study of the Incidence of Morbidity and of Disorders Secondary to Serofibrinous Pleurisy in the Course of Pulmonary Tuberculosis in Children in the Period Before and After the Advent of Antibiotics. F. Batini and F. Biondi. Gior. clin. med. 39:1123-1143 (July) 1958 (In Italian) [Bologna, Italy].

The authors review the incidence of morbidity and of disorders secondary to serofibrinous pleurisy among 7,312 hospitalized children, aged 2 to 15 years, with pulmonary tuberculosis in the period before (1933-1948) and after the advent of antibiotics and other anti-infectives (1949-1956). Serofibrinous pleurisy developed in 292 children, one-half of whom had the disease on admission; in the other half it developed during the hospitalization period. The incidence of serofibrinous pleurisy was higher among boys (157) than among girls (135). The patients were followed up for 9 months after the remission of serofibrinous pleurisy for possible development of disorders secondary to this disease.

During the period preceding the use of anti-infectives (1933-1948), 207 children had serofibrinous pleurisy, and 174 (84%) recovered. The condition of 7 patients remained unchanged, and that of 19 deteriorated; 7 patients died. Disorders secondary to serofibrinous pleurisy developed in 73 children. During the period (1949-1953) when streptomycin and aminosalicylic acid were used in treating 62 patients with serofibrinous pleurisy, 59 (95.2%) were cured, but the condition of 3 became worse. Disorders secondary to serofibrinous pleurisy developed in 5 patients. During the period (1954-1956) when isoniazid was used in treating 23 patients with serofibrinous pleurisy, all the patients were cured, and disorders secondary to this disease developed in only 1.

The incidence of serofibrinous pleurisy as a complication which developed during the hospitalization of children with pulmonary tuberculosis decreased considerably on the advent of antibiotics and, in particular, after the introduction of the antibacterial agent, isoniazid. However, the occurrence of this form of pleurisy as an accompaniment to tuberculous disease on admission in this group of children remained unchanged in terms of percentage, but the age at incidence was raised, on an average, from 11 to 15 years. The authors suggest prolonged maintenance therapy with anti-infectives in children who have recovered from serofibrinous pleurisy as a form of chemotherapeutic prophylaxis for the prevention of disorders secondary to this disease.

Acute Poisoning Associated with Inhalation of Mercury Vapor: Report of Four Cases. F. T. Matthes, R. Kirschner, M. D. Yow and J. C. Brennan. Pediatrics 22:675-688 (Oct., Part 1) 1958 [Springfield, Ill.].

The authors report on 4 members of a Negro family, a 19-year-old mother and 3 children, aged 30, 20, and 4 months, respectively, who were brought to Jefferson Davis Hospital in Houston, Texas, about 36 hours after exposure to mercury vapor. The mother had painted a small gas space-heater with a mixture of mercury, turpentine, and aluminum paint and had heated the stove in an attempt to make the mixture adhere to the surface. The heater was allowed to burn all night while the mother and children were asleep in their 2-room home. The 20-month-old infant was dead on admission to hospital, and the other 2 infants died 66 hours and 5 days, respectively, after the onset of symptoms. The mother was acutely ill for 48 hours after her admission, and thereafter there was steady improvement. The illness of all 4 patients was characterized by the sudden onset of tachypnea, cough, fever, gastrointestinal disturbances, and central nervous system manifestations. Ordinary laboratory tests were not helpful in establishing the diagnosis. Quantitative analysis of the urine for mercury was suggestive but not diagnostic. Chest roentgenograms revealed interstitial pneumonitis. Autopsies were performed on the 3 children, and analysis of tissue for mercury in the lungs, liver, and spleen of 2 showed substantially increased mercury content. The outstanding pathological features in the 3 children were erosive bronchitis and bronchiolitis, with severe interstitial pneumonitis.

At the present time the most generally accepted therapy for acute poisoning caused by ingestion of mercury consists of early administration of dimercaprol (BAL). Its use is probably also indicated in acute poisoning caused by inhalation of mercury vapor. Supportive care in the form of oxygen, mist, and parenterally administered fluids is indicated.

The Treatment of Acute Respiratory Infection in Infants. H. I. A. Nisbet and F. Wilson. Brit. J. Anaesth. 30:419-434 (Sept.) 1958 [Altrincham, England].

In spite of modern advances in treatment, there is still a significant rate of mortality among infants who suffer from acute respiratory infections. Failure to clear secretions from the air passages results in severe respiratory obstruction and increasing hypoxia. Oxygen demand is increased by virtue

Ninety patients, in whom severe pruritus was a distressing and complicating factor in acute and chronic dermatoses and systemic diseases, were treated with trimeprazine in the course of the past year. The patients selected were chiefly those in whom pruritus had been completely or partially refractory to other forms of therapy, such as topical applications or systemic administrations of steroids, antihistamines, sedatives, and tranquilizers. They ranged in age from 1 year to 75 years; 68 were female, and 22 were male. All but 2 were ambulatory. The initial dose consisted of one 2.5-mg. tablet taken 2 or 3 times a day. As the study progressed, it was evident that drowsiness, a mild side-effect, could be largely eliminated by having the patients take their dose of trimeprazine just prior to meals. The dose taken before retiring was usually twice the daytime dose because of increased nighttime itching. Even though nighttime doses were sometimes as high as 20 mg., lethargic effects the following morning were reported by only one patient. The author concludes that trimeprazine is an effective antipruritic when given orally and that it can be administered in small daily doses. It produces no serious untoward effects, even upon prolonged administration, and permits a reduction in concomitant therapy.

The Nylon Brush. A. Savill. Brit. J. Dermat. 70:296-299 (Aug.-Sept.) 1958 [London].

The author comments on the histories of several patients who complained of hairfall which ceased when a nylon brush was replaced by a bristle brush. Several persons on being questioned admitted that, when brushing with a nylon brush, more hair came out than when brushing with a bristle brush. In the use of nylon brushes some hairs appear to be pulled out with roots intact. The old-fashioned hair brush is becoming rare, since its bristles, taken from hogs and wild boars of Siberia and the coldest regions of Manchuria, are now difficult to obtain. The need to produce another type of brush resulted in the nylon brush. The bristles of this brush are composed of monofilaments of synthetic nylon, which are cut to the required length; this process can leave an uneven square end, which is injurious.

In studying various types of nylon brushes under a magnifying glass, the author found that nylon bristles have different types of points: (1) rounded points, like the head of a match—safe to use; (2) square points, which look as if cut square—not safe; and (3) square-cut ends, gently rounded off—not so harmful. Furthermore, some firms are replacing nylon bristles with molded Polythene quills which are smooth and resilient, with rounded ends. This kind of brush ensures that the hair shafts do not become entangled, frayed, or pulled out by the roots.

UROLOGY

Treatment of Carcinoma of the Bladder. J. C. Anderson. Brit. J. Urol. 30:330-337 (Sept.) 1958 [Edinburgh].

Although bimanual pelvic examination may help by proving or excluding the presence of gross invasion of the pelvic cellular tissues, or microscopic examination of fragments obtained by various means may yield some information regarding the character or activity of the tumor, the cystoscopic appearance is the most certain guide to treatment of bladder carcinoma, and it is of paramount importance that the surgeon and radiotherapist should cooperate. The author seldom uses general anesthesia for cystoscopy but generally only a local anesthetic. For the induction of deeper anesthesia he uses a caudal or sacral, but never a spinal, anesthetic. Some information is gained as the cystoscope is passed; it may impinge on a growth or be deflected. The patient empties his bladder before he comes for examination, and residual urine is noted. The ease with which the bladder is washed clear and its capacity are informative. The cystoscopic appearance of the tumor determines the choice of treatment, although the age and physical condition of the patient and the infection may influence it to some extent.

The choice is governed by the desire to keep the ureters in the bladder as long as possible. If the villi are fine and the base narrow, with no surrounding epithelial change, varicosity, or sign of lymphatic obstruction, cystoscopic diathermy is employed, even if the lesions are multiple. Suction or transurethral resection may help to reduce the size of a large tumor. If the lesions are recurrent or multiple, the posterior part of the urethra is examined for seedlings. If the tumor is too large for accurate assessment, open operation may be advisable. The author decides upon an open operation (1) when the tumor has blunted fronts, has a wider base, is sessile, or if there are varicosities or a velvety creep from the base; also when there are satellites close to it or other local or diffuse epithelial changes and (2) if the tumor is solid, nodular, or invasive, is less than 3 or 4 cm. in diameter on the base of the bladder or 5 cm. in diameter elsewhere, and has not invaded the pelvic cellular tissues. Bullae appear when the growth invades the bladder wall: the bullous edema is gross, and the bladder becomes fixed when the growth invades the pelvic cellular tissues.

If the diameter of the growth is more than 4 cm. and it has invaded the extravesical tissues, then supervoltage roentgen-ray irradiation is the treatment of choice. Multiple papillomas should be kept under control by cystoscopic diathermy for as long as possible. When this is impossible, a choice must be made between wide partial cystectomy, supervoltage roentgen-ray irradiation, or, when these of the increased respiratory effort, while oxygen supply is diminished because of the defective ventilation. When such a state of respiratory insufficiency exists, antibiotics are of little value unless the airway can be maintained until such time as they can exert their beneficial effect. Similarly, an obstructed airway must reduce the value of oxygen therapy. Methods by which this state of respiratory insufficiency may be alleviated are discussed. These include the use of endotracheal intubation, suction, bronchoscopy, tracheotomy, posture, and humidity; and of controlled respiration in cases in which the infant is too weak to maintain adequate ventilation by its own unaided efforts.

A series of 18 infants treated by such methods is described. Thirteen of these infants survived. Several case histories are presented in some detail, while the others are included in tabular form. The 5 deaths are discussed. In certain of these cases the presence of associated lesions rendered survival unlikely. Some complications are mentioned, in particular those arising from endotracheal intubation in infants. While these problems exist, they should not be held to contraindicate this procedure, especially in cases in which intubation and suction are essential for relief of respiratory obstruction and the reestablishment of adequate ventilation.

Sigmamycin in Pediatrics. J. Felder. Schweiz. med. Wchnschr. 88:953-958 (Sept. 27) 1958 (In German) [Basel, Switzerland].

Signemycin (Sigmamycin) is a combination of 2 parts of tetracycline and 1 part of oleandomycin. This combination drug was available for oral application in the form of capsules and of a sirup, and for intravenous and local application in the form of ampuls. The author reviews his experiences with it during a 6 months' treatment of 128 children, in 110 of whom the therapeutic result could be verified by clinical and bacteriological data. This group included children with septicemia, purulent meningitis, infections of the respiratory tract, osteomyelitis, arthritis, enteritis, infections of the urinary tract, purulent skin diseases, and suppurative lymphadenitis. A table shows that signemycin produced cure in 115 of the 128 children and failed in only 6. The therapeutic effect appeared promptly, and the drug was well tolerated. Secondary effects of the drug were observed in about one-fifth of the patients, but they were harmless, requiring premature interruption of the treatment in only one patient.

All strains of staphylococci that were tested were sensitive to signemycin. The reliable and prompt action of the drug and the fact that it can be administered by various routes and that it is well tolerated make signemycin one of the most useful therapeutic agents against serious bacterial infections caused by many different micro-organisms. In very acute cases, especially in septicemia, purulent meningitis, arthritis, osteomyelitis, and complicated pneumonia, the author recommends a high initial dosage, orally of 100 to 200 mg. per kilogram of body weight daily, or intravenously of 50 mg. per kilogram daily.

DERMATOLOGY

Effect of Oral Steroid on Non-Inflammatory Scalp Ringworm. N. M. Kanof. J. Invest. Dermat. 31:139 (Sept.) 1958 [Baltimore].

A 9-year-old Negro boy was seen at Children's Hospital, Washington, D. C., for alopecia areata of 2 years' duration. The child also had noninflammatory ringworm infection of the scalp with typical fluorescence of broken-off hairs on examination with Wood's light. After 2 weeks of oral therapy with prednisone (Meticorten), 5 mg. 4 times daily, for alopecia areata and of local therapy with diamthazol (Asterol) dihydrochloride ointment for the ringworm, there was a definite lessening of the number of fluorescent hairs in the ringworm sites. The application of Asterol ointment was then discontinued, and the patient was given only steroid therapy orally. At the end of 6 weeks there was no evidence of fluorescence under the Wood light. The alopecia areata was greatly improved.

Subsequently, a small pilot experiment was carried out on 8 children with noninflammatory tinea capitis due to Microsporum canis. All these patients had involvement of at least two-thirds of the scalp and had been refractory to topical therapy. After 4 to 10 weeks of oral therapy with prednisone, 20-25 mg. daily, all the patients demonstrated a marked change in the affected scalp hairs—either in a marked decrease in the number of broken-off fluorescent hairs or in a peculiar change of the fluorescence from brilliant emerald green to a grayish-white hue. It was especially interesting to note that, wherever fluorescence could no longer be observed, hairs of normal length were present. Further observations are required to confirm and to interpret these effects.

A New Oral Antipruritic. P. L. Williams. Northwest Med. 57:1162-1164 (Sept.) 1958 [Seattle].

This report is concerned with trimeprazine (Temaril), which is the tartrate salt of *dl*-10-(3-dimethylamino-2-methylpropyl)-phenothiazine. Since preliminary investigations with trimeprazine had indicated that this drug, when taken orally, exerts a potent and seemingly specific antipruritic effect in such unrelated conditions as biliary cirrhosis, poison ivy, and neurodermatitis, it seemed worthwhile to undertake an evaluation of trimeprazine in a private dermatological practice to elucidate its antipruritic effect.

Ninety patients, in whom severe pruritus was a distressing and complicating factor in acute and chronic dermatoses and systemic diseases, were treated with trimeprazine in the course of the past year. The patients selected were chiefly those in whom pruritus had been completely or partially refractory to other forms of therapy, such as topical applications or systemic administrations of steroids, antihistamines, sedatives, and tranquilizers. They ranged in age from 1 year to 75 years; 68 were female, and 22 were male. All but 2 were ambulatory. The initial dose consisted of one 2.5-mg. tablet taken 2 or 3 times a day. As the study progressed, it was evident that drowsiness, a mild side-effect, could be largely eliminated by having the patients take their dose of trimeprazine just prior to meals. The dose taken before retiring was usually twice the daytime dose because of increased nighttime itching. Even though nighttime doses were sometimes as high as 20 mg., lethargic effects the following morning were reported by only one patient. The author concludes that trimeprazine is an effective antipruritic when given orally and that it can be administered in small daily doses. It produces no serious untoward effects, even upon prolonged administration, and permits a reduction in concomitant therapy.

The Nylon Brush. A. Savill. Brit. J. Dermat. 70:296-299 (Aug.-Sept.) 1958 [London].

The author comments on the histories of several patients who complained of hairfall which ceased when a nylon brush was replaced by a bristle brush. Several persons on being questioned admitted that, when brushing with a nylon brush, more hair came out than when brushing with a bristle brush. In the use of nylon brushes some hairs appear to be pulled out with roots intact. The old-fashioned hair brush is becoming rare, since its bristles, taken from hogs and wild boars of Siberia and the coldest regions of Manchuria, are now difficult to obtain. The need to produce another type of brush resulted in the nylon brush. The bristles of this brush are composed of monofilaments of synthetic nylon, which are cut to the required length; this process can leave an uneven square end, which is injurious.

In studying various types of nylon brushes under a magnifying glass, the author found that nylon bristles have different types of points: (1) rounded points, like the head of a match—safe to use; (2) square points, which look as if cut square—not safe; and (3) square-cut ends, gently rounded off—not so harmful. Furthermore, some firms are replacing nylon bristles with molded Polythene quills which are smooth and resilient, with rounded ends. This kind of brush ensures that the hair shafts do not become entangled, frayed, or pulled out by the roots.

UROLOGY

Treatment of Carcinoma of the Bladder. J. C. Anderson. Brit. J. Urol. 30:330-337 (Sept.) 1958 [Edinburgh].

Although bimanual pelvic examination may help by proving or excluding the presence of gross invasion of the pelvic cellular tissues, or microscopic examination of fragments obtained by various means may yield some information regarding the character or activity of the tumor, the cystoscopic appearance is the most certain guide to treatment of bladder carcinoma, and it is of paramount importance that the surgeon and radiotherapist should cooperate. The author seldom uses general anesthesia for cystoscopy but generally only a local anesthetic. For the induction of deeper anesthesia he uses a caudal or sacral, but never a spinal, anesthetic. Some information is gained as the cystoscope is passed; it may impinge on a growth or be deflected. The patient empties his bladder before he comes for examination, and residual urine is noted. The ease with which the bladder is washed clear and its capacity are informative. The cystoscopic appearance of the tumor determines the choice of treatment, although the age and physical condition of the patient and the infection may influence it to some extent.

The choice is governed by the desire to keep the ureters in the bladder as long as possible. If the villi are fine and the base narrow, with no surrounding epithelial change, varicosity, or sign of lymphatic obstruction, cystoscopic diathermy is employed, even if the lesions are multiple. Suction or transurethral resection may help to reduce the size of a large tumor. If the lesions are recurrent or *multiple*, the posterior part of the urethra is examined for seedlings. If the tumor is too large for accurate assessment, open operation may be advisable. The author decides upon an open operation (1) when the tumor has blunted fronts, has a wider base, is sessile, or if there are varicosities or a velvety creep from the base; also when there are satellites close to it or other local or diffuse epithelial changes and (2) if the tumor is solid, nodular, or invasive, is less than 3 or 4 cm. in diameter on the base of the bladder or 5 cm. in diameter elsewhere, and has not invaded the pelvic cellular tissues. Bullae appear when the growth invades the bladder wall: the bullous edema is gross, and the bladder becomes fixed when the growth invades the pelvic cellular tissues.

If the diameter of the growth is more than 4 cm. and it has invaded the extravesical tissues, then supervoltage roentgen-ray irradiation is the treatment of choice. Multiple papillomas should be kept under control by cystoscopic diathermy for as long as possible. When this is impossible, a choice must be made between wide partial cystectomy, supervoltage roentgen-ray irradiation, or, when these have failed, total cystectomy, always remembering that the posterior part of the urethra may be involved as well as the bladder. After cystectomy it is better to create an ileal bladder, because the ureters are divided and anastomosed at a higher level where their blood supply is better. One type of bladder carcinoma difficult to diagnose resembles eczema and is accompanied by intense dysuria. The appearance is explained by rapid intramural spread. The prognosis is bad unless supervoltage roentgen-ray irradiation is given early. A dose of 5,000 or 6,000 r is aimed at. The results of treatment by supervoltage irradiation are miraculous, particularly in the solid infiltrating carcinoma which may vanish, leaving an apparently healthy mucosa. If it does not disappear completely, it may shrink; if ulcerated, it may heal; and, as a rule, it stops bleeding. The patient may be free from pain and discomfort for several years, perhaps until he dies of some other condition. After a lapse of time the growth may come to life again, but cystectomy or ureteric transplant can still be done.

The Investigation and Significance of Persistent and Recurrent Urinary Infection in Children. W. I. Forsythe and I. R. Wallace. Brit. J. Urol. 30:297-302 (Sept.) 1958 [Edinburgh].

In children with persistent or recurrent urinary infection, it is important to use all available diagnostic procedures in order to discover the true nature of the malady before irreparable damage is done to the urinary system. The authors present observations on 17 boys and 34 girls who were investigated because of persistent and recurrent urinary infection. Except for 3 boys who were 18 months (2) and 2 years old, respectively, the ages of the 51 children ranged from 4 to 14 years. Eight boys and 11 girls had persistent urinary infection, and 9 boys and 23 girls had recurrent urinary infection. Of the 19 children with persistent infection, 5 boys and 6 girls showed abnormalities. Of the 32 children with recurrent infection, 9 boys and 13 girls showed abnormalities. A critical analysis of the symptoms did not show any significant difference between the patients with abnormalities and those without. The clinical examination was of little value because, apart from 2 children with palpable bladders, no abnormal physical signs relevant to the genitourinary tract were found. In 20 children the infecting organism was Escherichia coli, and in the remainder a variety of organisms was found. Intravenous pyelography revealed abnormalities in 18 cases, but the true nature of these was not appreciated in 9 cases until micturition cystography was undertaken, and in 4 cases retrograde pyelography was needed before the exact nature of the abnormality was discovered. Micturition cystograms revealed abnormalities in 26 cases, but the full nature of these was not appreciated in 9 cases until intravenous pyelography was undertaken, and in 2 cases retrograde pyelography was needed before the exact nature of the abnormality was discovered. Thus, in 28 cases intravenous pyelography and micturition cystography were sufficient to establish the complete diagnosis, and in only 5 cases was retrograde pyelography required.

The authors advise excretory urography and micturition cystography in the initial investigation of these children. If this procedure is followed, many children will avoid unnecessary instrumentation. Should the findings prove inconclusive, though, urethroscopy, cystoscopy, and retrograde pyelography must be undertaken. Observations on boys revealed that 67% of those with recurrent and 63% of those with persistent urinary infections had lesions causing obstruction or stasis. Of 19 girls with anomalies, only 1 showed an obstructive lesion; however, abnormal widening of the internal vesical sphincter and vesicoureteral reflux were common in girls. The cause of widening of the internal sphincter is unknown, but an infective origin is unlikely, because the authors found a similar anomaly in 26 girls with enuresis who had sterile urines and no history of urinary infection. A neurogenic cause cannot be excluded, because in many cases it is impossible to distinguish roentgenologically between the inverted spinning-top appearance of the wide bladder neck and the funneling of the vesical outlet in the neurogenic bladder. The authors think that the condition is due to hypotonia of the internal vesical sphincter, but they are unable to say whether or not it is congenital in origin. According to Hinman, urethral ascension to the bladder is a common cause of urinary infection in female infants and girls. An ascending infection is more likely to occur when the internal vesical sphincter is incompetent.

Hunner's Ulcer. C. H. Kinder and R. D. Smith. Brit. J. Urol. 30:338-343 (Sept.) 1958 [Edinburgh].

The authors review the records of cases classified as Hunner's ulcer at St. Peter's and St. Paul's hospitals in London during the last 10 years. In only 27 of the 42 patients classified as having this condition could Hunner's ulcer be definitely identified. The youngest patient was 33 years old and the oldest 71. No predisposing factor was found, but in 8 women symptoms apparently began after a pelvic operation or childbirth. It is possible that some of these pelvic operations were wrongly performed for symptoms produced by an undiagnosed Hunner's ulcer. There were only 2 male patients, aged 46 and 54 years respectively. The dominant symptoms of Hunner's ulcer were gross frequency, urgency, and pain. The most severely affected patients were confined to their homes because of frequency of micturition occurring as often as every quarter of an hour by day and up to 10 times by night. Pain was both suprapubic and urethral and in some instances was referred to the loin. It was made worse by a full bladder and relieved by micturition.

Physical examination was not helpful. The urine was usually clear apart from occasional hematuria, and any infection was incidental and inconstant. Most patients had had urograms done, and these were always normal apart from showing a contracted bladder in the worst cases. The bladder capacity was often reduced to 4 to 6 oz., rarely as low as 2 oz. Cystoscopy in the conscious patient was painful and the appearances variable. Small hemorrhagic patches were noted in the vault and lateral or posterior walls, which on close inspection often surrounded shallow irregular linear ulcers or trabecular scars. The rest of the bladder was smooth, pale, and parchment-like. The affected areas would heal, only to break down at a later date. The trigone and the fixed part of bladder were never involved. When cystoscopy was carried out with a flushing instrument, petechial spots appeared on the affected areas throughout the bladder. These spots would bleed on further bladder dilatation, and sometimes the mucosa was seen to split.

Conservative therapy, apart from dilatation, was not effective. Ureterosigmoidostomy was performed 10 times, with 2 deaths; the surviving patients obtained complete relief. Ileocystoplasty was carried out 3 times, but its value is difficult to assess. It appears that either the stoma has to be very wide or extensive partial cystectomy has to be performed for relief of symptoms. The differential diagnosis is from tuberculous and other forms of chronic cystitis, and carcinoma of the bladder. Hunner's ulcer is only one form of chronic interstitial cystitis. The etiology is still unknown, but the possible causes are discussed. It is not likely to be infective, but may be due to hormonal influences and may be partly psychosomatic.

Analysis of 200 Cases of Carcinoma of the Prostate Treated Conservatively. E. J. Satter and J. B. Wear. Wisconsin M. J. 57:327-329 (Sept.) 1958 [Madison].

The authors report on 100 patients with carcinoma of the prostate, who were subjected to orchiectomy and treated with Stilbestrol at the University Hospitals in Madison, Wis., during 1941-1942. Results of treatment in this group of patients ("treated group") were compared with those in another group of 100 patients with carcinoma of the prostate who were subjected to transurethral resection only ("untreated group"). The youngest patient in the untreated group was 47 years old and the oldest 87; the average age of this group was 69.9 years. The patient surviving longest in the untreated group lived 9 years, and the patient surviving longest in the treated group lived 15 years. The average life span of the patients in the untreated group was 22 months after establishment of diagnosis; the survival time of the patients in the treated group was 56 months from the time diagnosis was made. The survival time was best in the 70-to-79-year-old patients in the untreated group and in the 60-to-69-year-old patients in the treated group. The 80-to-89-year-old patients in the treated group lived 32 months longer than those in the untreated group. This indicates that age is no contraindication to the institution of orchiectomy and the administration of Stilbestrol for the treatment of carcinoma of the prostate. Eight of the patients in the treated group lived 10 years or longer. Treated patients, 70 to 75 years old, lived half of their normally expected life span, and patients, 75 to 85 years old, lived 75% of their normally expected span. The total of added years of adult life in the treated group, as compared with the untreated group, was 283 years.

OPHTHALMOLOGY

Recovery of Toxoplasma from a Human Eye. M. J. Hogan, P. A. Zweigart and A. Lewis. A. M. A. Arch. Ophth. 60:548-554 (Oct.) 1958 [Chicago].

The authors recovered from the enucleated eye of a 20-year-old man a strain of Toxoplasma organisms which exhibited low virulence for animals. The patient had a quiescent disease up to the age of 12 years. The significance of a chorioretinal scar in the macula of the right eye, which was discovered at the age of 1½ years, was not apparent to the physician or the family. At the age of 12 years the patient had a sudden diminution of vision in his good left eye, which showed a heavy vitreous haze and an indistinct massive yellowish area of inflammation extending from the disk to the temporal periphery. Roentgenograms of the skull showed calcifications. The neutralizing antibody test and the skin test were positive, and a diagnosis of congenital ocular toxoplasmosis was made. Five months after the onset the vitreous haze in the left eye had cleared so that vision was 20/70. Two and one-half years later the lesion was fairly well healed, leaving extensive scarring and pigmentation of the entire temporal fundus. The vision was 20/100. For several years relapses occurred in this eye, so that the vision was lost. The eye became divergent and hypotonic, a cataract developed, and the eye started to shrink. The patient requested enucleation, which was done. The dye-test titer one year after enucleation was 1:16, and the skin test was still positive.

The chorioretinal tissue from the back of the enucleated eye was ground in a mortar, diluted with sodium chloride solution, and inoculated intraperitoneally into 4 mice. The mice did not show signs of illness, and 3 weeks later their brains were removed, ground, and inoculated intraperitoneally into 4 other mice. Six days later these mice showed some signs of illness, and in a small amount of aspirated peritoneal fluid a few organisms were found which strongly resembled those of the Toxoplasma genus. Other mice were given inoculations of this fluid; 8 days later the animals became ill, and extracellular Toxoplasma organisms were found in their peritoneal fluid. Subinoculations were continued on mice, guinea pigs, and rabbits. The culture studies showed that the Toxoplasma strain originally recovered from the enucleated eye and designated MF strain offered a distinct contrast in virulence to the RH strain isolated and cultured from the eye of an adult by Jacobs and to the strains obtained from persons with severe systemic infections. This finding supports the concept that some cases of inapparent congenital toxoplasmosis, with late exacerbations of the disease, are caused by Toxoplasma strains of low virulence. In many cases of congenital toxoplasmosis the disease is extremely mild and is unrecognized until a late flare-up occurs. The isolation of Toxoplasma organisms from the patient's eye 20 years after birth shows the great persistence of these organisms in pseudocyst form in the tissues, despite the low virulence of the strain.

Ocular Toxoplasmosis: The XIV. Jackson Memorial Lecture. M. J. Hogan. Am. J. Ophth. 46:467-494 (Oct.) 1958 [Chicago].

According to Hogan, the acute manifestations of congenital toxoplasmosis are well established and include chorioretinitis, encephalomyelitis, and visceral inflammation. Ocular toxoplasmosis may be overlooked in an apparently healthy child until attention is directed to the eyes by the development of a strabismus, by detection of amblyopia in one or both eyes during a routine eye examination, or by the development of increased blurring due to a late relapse of the chorioretinal inflammation. The author reports on 36 children with congenital ocular toxoplasmosis, whose ages ranged between less than 6 months and up to 12 months at the onset of the disease. Seven of the 36 patients showed evidence of cerebral calcification which could be considered to be toxoplasmatic; the condition was unilateral in 11; a late relapse of the congenital infection occurred in 12 patients; and strabismus was the first and most common eye complaint in 20 patients. Nine patients had positive results of dye tests and negative results on skin tests, indicating that the skin test is less reliable for diagnosis than the dye test. Nine patients had dye-test titers in excess of 1:512, and 13 had titers between 1:128 and 1:512. In addition to the 36 patients with congenital toxoplasmosis, there were observed 4 others with a late relapse of congenital toxoplasmatic infections. Toxoplasma organisms were isolated from the enucleated eye of one of these patients 20 years after birth. [The case of the latter patient is reported in detail in the preceding abstract.]

Ocular inflammation rarely occurs during the course of acute postnatally acquired systemic toxoplasmosis, although some cases have been reported. In patients with uveitis, questionable enlarged lymph nodes should be excised for microscopic and cultural studies. The methylene blue tests performed on patients with uveitis in various age groups showed 35% of the serums to be positive in a titer of 1:16 or higher, as compared with a 25% incidence in a miscellaneous group of patients with eye diseases other than uveitis. The correlation of results of the methylene blue test and the toxoplasmin test in 617 patients with uveitis revealed that 198 (32%) had positive results from the dye test and 141 (23%) had positive results from the skin test. Forty-eight per cent of the patients with chorioretinitis reacted positively to the dye test and 36% reacted positively to the skin test. This can be compared with 25% and 18% of the normal population in this area. The various skin tests on 1,241 patients with uveitis and on a miscellaneous group disclosed that about 40% of the patients with chorioretinitis and 18% of the patients with iridocyclitis had positive reactions to toxoplasmin tests. In this same group 43% of those with chorioretinitis and 23% of those with iridocyclitis had positive dye-test titers. The percentage of the incidence of positive dye and skin tests in the iridocyclitis group was the same as in the control group. The cases of 5 adult patients, between the ages of 32 and 53 years, with acquired ocular toxoplasmosis have been reported in detail; 2 of these were associated with acute systemic infections. Treatment with pyrimethamine (Daraprim) and sulfadiazine in patients with acquired ocular toxoplasmosis was found to be disappointing, but further studies seemed to be warranted.

Angiomatosis Retinae, Eleven Years After Diathermy Coagulation. D. Vail. Am. J. Ophth. 46:525-534 (Oct.) 1958 [Chicago].

The author reports on a 40-year-old woman with angiomatosis retinae (Hippel's disease), who was operated on for a typical angioma in the left eye. The preoperative vision in this eye was 20/70. With the patient under intravenously administered Pentothal sodium anesthesia, the sclera over the site of the lesion between the 3-o'clock and the 4-o'clock position was exposed, and a single ignipuncture was made with a diathermy needle, 1.5 mm. long (40 ma. for 4 seconds). After ophthalmoscopic verification of the accuracy of the first puncture, 7 more ignipunctures were made around it. The scleral area covered was roughly 3 mm. in diameter. Ophthalmoscopic examination showed that the involved area was "cooked," white, and edematous, so that the outline of the cherry-red tumor could barely be seen. There was no intraocular hemorrhage. Recovery was uneventful. A follow-up examination 11 years after the operation showed that the corrected vision in the eye operated on was 20/20. The scar in the fundus of the eye showed slightly more pigmentation. There was no evidence of recurrence of the original angioma or the development of new ones. The cases of 38 patients with angiomatosis retinae treated by electrocoagulation were collected from the literature.

e ages of the patients ranged from 7 to 40 years. Nine of the 38 patients had both eyes operated on. Of the 47 eyes operated on, 33 (70%) were successfully cured, 6 were improved (eyeball saved, poor or little vision), and 8 were complete failures.

Angiomatosis retinae (Hippel's disease) and its systemic counterpart (Lindau's disease) are disease entities now firmly established in medicine. They are probably more common than supposed. Neurologists and neurosurgeons may miss the ocular lesions; ophthalmologists, the systemic ones. Thus, teamwork is essential. Angiomatosis retinae can be divided into 4 stages of progression during its relentless evolution. Stage 1 consists of one or more dilated and tortuous veins, more or less parallel, running usually to the peripheral and preequatorial areas of the retina. They terminate in a circumscribed tumorous area (the angioma) which may be single or, much more rarely, multiple. Stage 2 consists of retinal hemorrhages, but especially of a deposit of flaky lipid exudates scattered in the various layers of the retina. Stage 3 consists of massive exudation and retinal detachment, and stage 4 is terminal with uveitis, absolute glaucoma, and loss of the eye. Of the 47 eyes operated on, the disease was in stage 1 in 10, in stage 2 in 21, and in stage 3 in 9; the stage of the disease was not specified in the remaining 7. Stages 1 and 2 are the most favorable for surgery, although the operation was considered successful in 4 of the 9 eyes operated on early in stage 3. Mild surface diathermy coagulation followed by pinpoint ignipunctures into the tumor itself seems to offer the best prospect for success. If the tumor is destroyed, the feeder vessels shrink in size and lose their tortuosity. The lipid deposits disappear within one year thereafter. If they do not disappear, it presumably means that the tumor has not been destroyed or new ones have developed. The greatest hazard is hemorrhage into the retina, choroid, or vitreous. For this reason diathermy should be applied with the weakest current capable of doing the job and under frequent ophthalmoscopic control. Direct coagulation of the tumor by diathermy or similar agents gives far better and more certain lasting results than those reported to be obtained by roentgen-ray or radium irradiation.

THERAPEUTICS

Pyrimethamine in the Treatment of Polycythemia Vera. J. W. Frost, R. Jones Jr. and U. Jonsson. South. M. J. 51:1260-1265 (Oct.) 1958 [Birmingham, Ala.].

Pyrimethamine (Daraprim) was given to 14 patients with polycythemia vera for periods varying from 3 to 26 months. Three of the 14 patients received 2 courses of the drug, so that a total of 17 courses of treatment were given. The drug was given by mouth in doses of 25 to 100 mg. daily until the red blood cell count fell to normal limits or below. Treatment then was continued with a reduced dose as maintenance therapy in some patients; in other patients administration of pyrimethamine was continued with the same dose and folic acid was given concurrently in order to determine whether the effect of pyrimethamine on the formed elements of the blood could be reversed by folic acid.

In 11 of the 14 patients there was a fall in hemoglobin level, hematocrit, and red blood cell count. The response to the drug occurred slowly over a period of 1 to 5 months. At the same time there was usually relief of symptoms and reduction in the size of the spleen, when this organ was enlarged. In 9 of the 14 patients the disease was controlled by maintenance therapy for periods ranging from 6 to 19 months. In several of the patients side-effects of pyrimethamine were observed. These consisted of thrombocytopenia, leukopenia, atrophic glossitis, ulcers of buccal mucous membranes, alopecia, and megaloblastic bone marrow changes. These side-effects were never serious and could be reversed by folic acid even with continued pyrimethamine administration. The reversal of all demonstrable biological effects of pyrimethamine by concurrent administration of folic acid indicates that its therapeutic effects in polycythemia are entirely due to its function as a folic acid antagonist. Despite some disadvantages, the drug can be used to control polycythemia satisfactorily in most patients.

Meprobamate Idiosyncrasy: Report of a Case and Review of the Literature. N. D. Charkes. A. M. A. Arch. Int. Med. 102:584-593 (Oct.) 1958 [Chicago].

Meprobamate (Miltown or Equanil) has been in use for several years. Reports on toxic effects have been scattered. One death has been reported. This communication presents a case of meprobamate idiosyncrasy, with skin biopsy and skin testing. It reviews the published reports to date and discusses possible etiological factors in the pathogenesis of the anaphylactoid reaction. The records of more than 6,500 patients have been summarized to date. Twenty-three cases of attempted suicide and 113 cases of idiosyncrasy have been reported. In one-third of the 113 cases of idiosyncrasy the reaction began within 8 hours of commencement of drug therapy, and all reactions, except in 2 patients, had occurred by the end of the first week. The earliest response was within 15 minutes. The reaction had not been seen in any suicidal attempt, so that excessive dosage was not a factor in precipitating it.

In meprobamate idiosyncrasy the rash was erythematous, maculopapular, or urticarial, or a combination of these, as in the case reported here, and may resemble a "boiled lobster." Vesicular and pustular eruptions have been noted occasionally. The rash was most prominent in the groins, inner thighs, buttocks, chest, axillas, and antecubital and inframammary folds; fixed eruptions have been seen. Petechiae were noted in 16% of the cases, almost always nonthrombocytopenic. Ecchymoses were rare, and the only patient with overt bleeding had aplastic anemia. The Rumpel-Leede test of capillary fragility was always positive in cases of purpura. A prominent and often distressing symptom in one-fifth of the cases was pruritus; however, many patients complained only of "burning" or a sensation of warmth. Other symptoms included anorexia, nausea, vomiting, diarrhea, yawning, headaches, chills, and fever, with temperatures of 101 to 103 F (38.33 to 39.44 C). Dizziness, fainting, hypotension, or shock occurred in almost 15%, and a few patients reacted with asthma, ectopic cardiac rhythms, numbness of the legs, emotional upsets, or mental confusion. A prior history of drug or pollen allergy was elicited in only a small number of patients, but, whereas the anaphylactoid reaction rate was only 0.5% for the group of 6,500 as a whole, it was 10 times as great for patients with known allergies.

Some investigators attempted to prove that the reaction was due solely to meprobamate by the administration of one tablet (400 mg.) some time later. This is a dangerous practice and should not be attempted merely to satisfy the curiosity of the clinician. Twenty-eight of the 30 patients who were given another tablet responded with a reaction which was frequently more violent than the original and which in several cases was accompanied by severe shock. At best, this second reaction lasted longer and responded more slowly to steroid therapy than the first. The most important step in the treatment of the anaphylactoid reaction is withdrawal of meprobamate. Indirect evidence is adduced implicating meprobamate as a histamine-liberating agent in certain patients.

Topical Application of a Solution of Pyrazinamide for the Treatment of Tuberculous Empyema. G. Costa and E. Moretti. Minerva med. 49:3269-3271 (Aug. 29) 1958 (In Italian) [Turin, Italy].

A solution of pyrazinamide was introduced topically twice a week for a period of 70 to 180 days in 18 patients with tuberculous empyema. Pyrazinamide treatment was given concomitantly with collapse therapy to 5 patients and after discontinuance of collapse therapy to 9 patients. Primary spontaneous pneumothorax was present in 2 patients. The first dose of pyrazinamide, consisting of 20 cc. of the solution, was followed by doses of 40 cc. Prednisolone was used as an adjunct to pyrazinamide in treating 5 patients in whom tuberculous empyema developed during collapse therapy. A dose of 100 mg. of isoniazid was combined with pyrazinamide in 6 patients with the chronic type of the disease, who had already been treated with and became refractory to isoniazid. Pyrazinamide brought about disappearance of effusion and made possible reinstitution of an efficacious collapse therapy in 5 patients in whom the disease was present during the artificial pneumothorax. Of 9 patients with tuberculous empyema treated with pyrazinamide after termination of collapse therapy, 4 patients obtained temporary relief for 2 months, 4 patients obtained no benefit, and the effusion turned from purulent into serous in 1 patient. Temporary improvement for 1½ months was observed in one patient with primary spontaneous pneumothorax, and complete healing of the pleural cavity was obtained in one patient.

The best results with pyrazinamide were observed in patients who had not previously received any chemotherapy and in those in whom the disease was of recent date. The combination of pyrazinamide and isoniazid was only slightly efficacious. A mild malaise, chest pain, and fever episodes were the most common side-effects noted at the onset of treatment with pyrazinamide. Five or 6 months after the onset digestive disorders developed in some patients who obtained only temporary relief with the drug. The authors suggest treatment with pyrazinamide in all instances in which benefits from other antibiotics have been exhausted. It may also be used as an adjunct to other antibiotics for the treatment of chronic types of the disease.

Iproniazid (Marsilid) in Angina Pectoris. A. M. Master. Am. Heart J. 56:570-582 (Oct.) 1958 [St. Louis].

Fifty-eight men and 16 women, between the ages of 40 and 79 years, with typical and severe angina pectoris were treated with iproniazid (Marsilid) for periods ranging from 1 week to 5 months. Each patient was given 50 mg. of the drug 3 times daily after meals. In an attempt to prevent the occurrence of peripheral neuritis and dryness of the mouth, 25 mg. of pyridoxine were given with each dose of iproniazid. Complete relief of pain was obtained by 13 patients and almost complete relief by 28 patients; improvement was doubtful in 4 patients, and 29 were therapeutic failures. Five of the 41 patients who obtained relief and 1 of the 29 patients who did not were in "status anginosus" when the treatment was instituted. Neither the resting electrocardiogram obtained from the patients nor the results of the Master "2-step" test to which they were subjected were altered in the course of the treatment with iproniazid. These findings suggested that the fundamental coronary disease was not altered. The precise mechanism of the relief of pain by iproniazid is unknown. The relief obtained can possibly be explained by cerebral stimulation, with uplift of mood, and increase of the pain threshold. There may be a direct effect on the autonomic nerve connections between the heart and the spinal cord and brain.

Severe side-reactions made withdrawal of the drug necessary in 57 patients. In some patients the drug was tolerated for only one month or less. The side-effects were mainly gastrointestinal, genitourinary, and cardiovascular; the latter included dizziness, fall in arterial pressure, and syncope. Three patients sustained an attack of acute coronary insufficiency in the course of the treatment, and acute coronary occlusion occurred in 2 additional patients, 1 of whom died. Less common complications were evidences of cerebral stimulation, peripheral neuritis, dryness of the mouth, hepatitis, and significant gain in weight. The fall in blood pressure is probably a factor in syncope and in attacks of acute coronary insufficiency. It may possibly be a factor in the precipitation of coronary occlusion. The physical overactivity associated with euphoria, excitement, and loss of pain may cause coronary insufficiency. For these reasons, the patient receiving iproniazid should be supervised closely. Blood pressure should be measured in the standing position. On the other hand, glyceryl trinitrate (nitroglycerin) should never be taken by the patient except in the sitting or recumbent position. In view of the numerous side-effects, some of which are potentially dangerous, further therapeutic trials with iproniazid should be carried out only in hospitals and by research teams.

Fluoxymesterone Therapy in Advanced Breast Cancer. B. J. Kennedy. New England J. Med. 259: 673-675 (Oct. 2) 1958 [Boston].

Investigations revealed that the halogenated androgen, 9α-fluoro-11β-hydroxy-17α-methyltestosterone, or fluoxymesterone, is an effective agent in the treatment of advanced breast cancer. It is an androgenic, anabolic hormone that may be administered orally. Fifty-six patients with advanced breast cancer were treated with it over a 2-year period: 48 of these patients had not received previous hormone therapy, and 8 had previously been treated by surgical hypophysectomy. Of the 48 patients, objective regressions of metastatic breast cancer occurred in 18 and subjective improvement in 25. The quality of improvement in the cancer was similar to that previously noted with testosterone propionate. The frequency of objective improvement would appear to be slightly greater than that with testosterone propionate. The obvious smallness of the series demonstrates the need for greater experience to increase the validity of the figure, but it is apparent that patients demonstrating regressions have survived longer than the nonresponding group. Of the 56 patients treated, 27 remain alive.

Observations on the side-effects of fluoxymesterone have revealed masculinizing changes and erythropoietic changes, as noted with other androgenic compounds. In the doses employed, though, the degree of hirsutism and acne has been less than that with testosterone propionate, and the degree of hoarseness, oily skin, and alopecia has been the same as with testosterone propionate. Increase in libido, encountered with testosterone propionate, did not occur with fluoxymesterone. Evidence of hypercalcemia developed in only 7% of the patients after the onset of fluoxymesterone therapy. The ease of administration, the less distressing masculinizing effects, and the antitumor effect attained are such that fluoxymesterone may be considered the androgen of choice in the treatment of advanced breast cancer. Androgenic hormones are most effectively employed in postmenopausal women with osseous metastases. Objective improvement occurs in about 25% of these patients, with a lower rate of response in patients with soft-tissue lesions.

PATHOLOGY

Primary Malignant Melanoma of the Oral Cavity: A Review of 105 Cases. A. P. Chaudhry, A. Hampel and R. J. Gorlin. Cancer 11:923-928 (Sept.-Oct.) 1958 [Philadelphia].

Primary malignant melanoma of the oral cavity is a rare tumor, the authors having found records of only 105 cases, including 2 previously described by themselves. This review is based chiefly on 93 cases, since the other 12 lacked adequate description. Primary malignant melanoma of the oral cavity occurred nearly twice as frequently in men as in women. This finding is in contrast to that for malignant melanoma of the skin, which affects both sexes equally. The youngest patient in the present study was 22 years of age and the oldest, 90 years; but in nearly 90% of the reported cases the patients were more than 30 years of age, and in 75% more than 40 years, with a peak in the 6th decade. The site of predilection for the disease was the upper jaw, where 75 (80%) of 93 cases originated. The other sites of involvement, in order of frequency, were the lower jaw, cheeks, tongue, and floor of mouth. In nearly 30% of the cases there was melanin pigmentation at the site at which the neoplasm originated. This pigmentation had appeared from a few months to several years before the tumor.

Malignant melanoma of the oral cavity has been reported in all races. In more than half of the 93 cases clinical evidence of lymph node metastases was recorded. In 19 cases there was clinical or roentgenologic evidence of generalized metastases. Of the 61 patients followed, 51 died of the disease. In 24 cases the survival period averaged 18½ months after diagnosis. There were only 3 patients who lived for more than 5 years. The authors feel that, in view of the serious prognosis of the disease, early recognition of the lesion and institution of radical surgery are desirable. The appearance of melanin pigmentation in the mouth and its increase in size and in depth of color should be viewed seriously.

BOOK REVIEWS

Pathophysiology in Surgery. By James D. Hardy, M.S., M.D., F.A.C.S., *Professor and Chairman, Department of Surgery and Director of Surgical Research, University of Mississippi Medical Center, Jackson.* Cloth. $19. Pp. 704, with 278 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1958.

This text, on the physiological disturbances observed in patients who are classified as presenting surgical conditions, goes beyond simple surgical patients and includes those presenting diseases for which surgical therapy may not be considered. In a limited space, adequate critical review is impossible. The book begins with a consideration of the physiology of injury and proceeds to fluid balance, surgical nutrition, the physiology of connective tissue, microbiology, burns, cancer, radiation, enzymology, aging, liver and biliary tract, pancreas, blood transfusion, alimentary tract, circulatory system, lungs, anesthesia, endocrine system, nervous system, infancy, and urologic considerations of special interest. In an attempt to emphasize a "surgical slant" some expressions employed might seem far-fetched, such as "surgical enzymology," the heading of one relatively short paragraph; "surgical aspects of aging," which in essence conveys the idea of danger in operating on patients whose vitality is reduced because of age; and the expression "surgical nutrition." It would seem after all that nutrition is nutrition and enzymology is enzymology.

The text is written in a conversational rather than formal style. The author attempts a wide coverage, sometimes exceeding what might appear the limits of the subject as indicated by the title. This may lessen a reader's confidence in what is related, as, for example, his confidence in what one man says in the chapters on the general physiological reaction of the patient to injury, the question of fluid and electrolyte balance, "physiological considerations in cancer," and urologic considerations of special interest. These are separate areas in which much work has recently been done, and a modern text should include sound critical evaluation based on thorough first-hand knowledge. Further perusal reveals some rather important gaps of which the author may not be aware. For example, only one paragraph and one sentence is devoted to the formation of gallstones. No mention is made of the classical studies of Phemister on calcium carbonate stone formation related to intermittent and complete cystic duct obstruction. In the consideration of gastric physiology much attention is paid only to hypersecretion and acidity. The all-important physiologic aspects of achlorhydria receive only one sentence and the word "achlorhydria" does not even appear in the index. In the discussion on the pancreas clinical reports with important implications for pancreatic physiology are not referred to. For example, the fact that in long-range survivors who had an excision of the duodenum and head of the pancreas with occlusion of the external secretion—this is a different situation than after total pancreatectomy—there may be no appreciable physiological disturbances, and that in human diabetics who had a total pancreatectomy the diabetes is not appreciably if at all aggravated.

Here and there one encounters obvious inaccuracies such as the statement that subtotal gastric resection "first performed by Theodor Billroth in 1881 was based upon the physiologic facts that hydrochloric acid is secreted by the cells of the fundus." Billroth performed a limited pylorectomy for cancer and was never concerned with gastric resection for ulcer since he was ignorant of the acid-ulcer concept. Also this is probably the first occasion where in a physiological treatise reference is made to a fiction "best seller" to help emphasize a point (page 602, "Point of No Return," J. P. Marquand). Probably the best feature of the work is the large number of diagrams, line-drawings, tables, graphs, and photographs. Many appear original and many tell the story without recourse to the text. Here again, however, some questions may arise, as in figure 93, which purports to have settled the question about the best method for alimentery tract reconstruction after pancreatoduodenectomy. Experienced surgeons would not agree with what is shown. The volume is well bound, the paper of high quality, the type is large, facilitating ease of perusal, and the bibliographies are fairly complete. The work is interesting and would be especially useful for advanced students, interns, residents, and Board examination candidates.

Hearing Therapy for Children. By Alice Streng, M.A., and others. Second edition. Cloth. $6.75. Pp. 353, with illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W. C. 1, England, 1958.

This is a somewhat revised edition of the 1955 publication of the same title. It purports "to include for the first time in one book the special skills and knowledge needed by members of those professional groups who work with hearing-handicapped children." Although this is a noteworthy

---

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

purpose, it would be difficult to include in one book all phases of such work and, although presented as a single cohesive work, the book consists of two parts. The first is a general discussion of the problem of deafness in children, causes and treatment of hearing loss, audiometry, and hearing aids. The rest of the book is devoted to specific techniques in the educational management of hard-of-hearing and deaf children. The first part should be helpful as an orientation to the field of pedoaudiology and the second half should be of particular interest and benefit to speech and hearing therapists and teachers of deaf children. The book contains good lists of references, particularly at the end of the chapters dealing with the education of children with impaired hearing. Each chapter has adequate figures and photographs. A few changes could have been made in a second edition which apparently were overlooked; for example, in the chapter on hearing aids, a discussion of the vacuum tube instruments preceded mention of transistor aids, in spite of the fact that practically all hearing aids now dispensed are of this type. The same chapter refers to the approval of hearing aids by the Council on Physical Medicine and Rehabilitation of the American Medical Association, a practice which that body discontinued several years ago. Despite certain shortcomings of this book, most of which may be due to the fact that there are five authors, its value to audiologists and teachers of hearing impaired children is apparent. Less obvious is its value to the general physician or even the otologist.

Circulation: Proceedings of the Harvey Tercentenary Congress Held on June 3rd-June 8th 1957 at the Royal College of Surgeons of England, London. Edited by John McMichael, M.D., F.R.C.P., F.R.S., Professor of Medicine, University of London, London. Cloth. $10.50. Pp. 503, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

The first part of this interesting volume consists of a series of historical essays dealing with the life of William Harvey and related material. These are presented by Kenneth Franklin, Frederick Willius, John F. Fulton, Charles Dodds, Geoffrey Keynes, Tom Hare, and others. The second part deals with a review of present knowledge of the circulation. Space does not permit a complete listing of titles and authors, although this should whet the appetites of all physicians, especially those with special interest in the circulation. To list a few of the participants, they include George Pickering, Louis Katz, Paul Wood, C. Heymans, Gustav Nylin, Donald Gregg, Claude Beck, Andre Cournand, Russell Brock, MacDonald Critchley, Seymour Kety, E. H. Botterell, James Learmouth, Stanley Bradley, and Russell Brain. The broad subjects covered include the role of the heart in circulation, hemodynamics, coronary circulation, pulmonary circulation, results of cardiac surgery, cerebral circulation, splanchnic circulation, and peripheral circulation.

In general the material is well presented although, as with all symposiums, the quality is uneven. There is one profound error of omission in this presentation. While the physiological presentations are complete, the therapeutic aspects discussed are almost entirely surgical. The uninitiated may be led to assume that these distinguished investigators believed that the only substantial progress in the understanding or the treatment of cardiovascular diseases has been by our surgical confreres. In actual fact, the number of patients whose problems are clarified or conditions benefited by the use of digitalis and the many other cardiac drugs, the anticoagulants, and the antihypertensive agents, to mention a few important groups, far exceeds the numbers of patients who will ever come to surgery for their cardiovascular conditions. Therefore, if treatment is considered at all, a more balanced presentation would be desirable. Nevertheless, one cannot but feel that William Harvey would have been pleased that such a distinguished group of scientists was gathered in his honor 300 years after his death and that their words will be available to others throughout the world. This is indeed a test of the durability of one's work.

Ciba Foundation Colloquia on Ageing, Volume 4: Water and Electrolyte Metabolism in Relation to Age and Sex. Editors for Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., and Maeve O'Connor, B.A. Cloth. $8.50. Pp. 327 with 85 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6; J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London, W. 1, England, 1958.

This small volume on the relationship of two subjects in the forefront of medical interest, viz., aging and electrolyte metabolism, contains 18 essays with appended discussions by participants in a colloquium sponsored by the Ciba Foundation. Although part of the book deals with electrolyte relationships to age and sex, most of it is concerned with more general aspects of the subject ranging from the genetic control of electrolyte metabolism in the erythrocyte to the effects of severe magnesium deficiency. The participants were eminent authorities in the field whose discussions, based on their own studies, add inestimably to the value of the book. The book should prove of interest to research workers in the field of electrolyte metabolism and its hormonal aspects in relation to age and sex. It is well printed and adequately illustrated, with the more pertinent references to the literature appended to each chapter.

QUESTIONS AND ANSWERS

ADULT IMMUNIZATION SCHEDULES

To the Editor:—*Please suggest optimum intervals for immunization protection of adults against the following diseases (with adequate initial immunization series): smallpox, diphtheria, tetanus, typhoid, influenza, and poliomyelitis.*

Nelson M. Taylor, M.D., Grosse Pointe, Mich.

Answer.—Assuming that adequate initial immunization series have been given to protect against the diseases listed, the optimum intervals for immunization protection of adults are as follows: smallpox, vaccination every three years; diphtheria, immunization not recommended for adults except in cases of Schick-negative reaction in a person exposed to special risks; tetanus, booster dose at the time of each injury where danger of tetanus exists, with reinjection in the absence of an injury at intervals of no longer than five years; typhoid, reinforcing injections every three years; influenza, injection every year for risk cases (as in old or chronically ill persons); and poliomyelitis, not enough time has elapsed yet to learn about the duration of the protection conferred by the Salk vaccine, but a fourth dose, given not earlier than one year after the third dose, could be administered to individuals exposed to special risks. It should be understood that these are general guiding schedules which vary according to the circumstances. For instance, for persons traveling to areas where smallpox is endemic, revaccination at intervals as short as six months may be desirable. The same is true for persons living in typhoid endemic areas, who should get a booster dose every year.

TEST FOR CARBON DIOXIDE COMBINING POWER

To the Editor:—*What is the physiological reason for equilibrating the blood with carbon dioxide in obtaining the value for carbon dioxide combining power?* *M.D., New York.*

Answer.—The carbon dioxide combining capacity of blood plasma represents the capacity of the hydroxyl ion in the blood plasma to combine with carbon dioxide, at the usual alveolar air tension of about 40 mm. Hg, to form bicarbonate. Introduced by Van Slyke and Cullen in 1917, this procedure consists in determining the carbon dioxide content of plasma that has been equilibrated with normal alveolar air, which contains about 5 to 6% of carbon dioxide and therefore has a tension of about 40 mm. Hg. From this value, the dissolved carbon dioxide, or carbonic acid, is subtracted, so that the difference represents the bicarbonate content. This type of determination is one measure of the hydroxyl content or "alkaline reserve" of the body. Among the advantages of this procedure is the fact that it does not require collection of blood anaerobically under oil or mercury, as any escape of carbon dioxide from the plasma during centrifuging or standing is counteracted in the actual determination by the equilibration. Among its disadvantages are that equilibration with alveolar air requires additional equipment and is time consuming and laborious; that it does not measure directly the concentration of either bicarbonate or total carbon dioxide in the circulating blood; and, most important, that it does not yield information about those acid-base derangements in which the ratio of bicarbonate ion to dissolved carbon dioxide at the actual carbon dioxide tension, rather than the concentration of bicarbonate ion at 40 mm. Hg, is the determining factor. Consequently, it has become much more common and acceptable to determine the carbon dioxide content of the plasma or serum from blood that has been collected under oil and centrifuged with precautions to prevent loss of carbon dioxide. The relationship between carbon dioxide content, expressed in millimoles per liter, carbon dioxide tension (p), expressed in mm. Hg, and the pH is contained in the well-known Henderson-Hasselbach equation:

$$\text{pH} = 6.10 + \log \frac{\text{mM. CO}_2 - 0.0301\ p}{0.0301\ p}$$

For example, in a case of diabetic acidosis reported in the literature, the carbon dioxide combining capacity was 22.6 vol. % or 10.1 mM. The carbon dioxide content was 5.28 mM. per liter at an actual tension of 11.8 mm. Hg. The pH was, according to the above equation, 6.10+log 13.8 or 7.24. The Henderson-Hasselbach equation and determination of carbon dioxide content also permit a readier understanding of other acid-base disturbances. To illustrate, in a case of respiratory overventilation reported in the literature, the carbon dioxide combining capacity of the arterial serum was 40.9 vol. % or 18.4 mM., not clearly abnormal. Yet, the plasma carbon dioxide content was 31 vol. % or 14 mM. per liter, the carbon dioxide tension in the circulation was 14.6 mm. Hg, and the pH was 7.59. In general, the determination of the plasma carbon dioxide content, that is, the sum of the bicarbonate

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

ion and the dissolved carbon dioxide at the actual carbon dioxide tension existing in the arterial circulation, may give more distinct and precise clues to the presence of acid-base derangements than the concentration of bicarbonate ion at 40 mm. Hg (the carbon dioxide combining capacity).

"AIR PLATES" AND CONTROL OF HOSPITAL INFECTIONS

To THE EDITOR:—*In an attempt to control staphylococcic infections in the hospital, the administrative and surgical staffs have requested the use of "air plates" throughout the operating room suite. It has been difficult to find much helpful information concerning a standard procedure for collecting such specimens and interpreting the findings. Specifically, what is the optimum time interval for exposure of the plates, how should the total colony counts be determined, and how extensive an attempt should be made to identify the colonies present? Should an attempt be made to identify all the colonies on each plate?*

William D. Kelly, M.D., Elmira, N. Y.

ANSWER.—The exposure of open Petri plates (blood agar plates or plates containing a comparable good nutrient) at various locations in the operating room has not been standardized. The plates are uncovered at selected locations throughout the room and are allowed to remain exposed to the air for periods ranging from one-half to one hour. On occasion, the plates are exposed in the operating room during different periods of activity and inactivity for comparative information. This procedure may detect bacteria or dust particles which "fall out" and inoculate the medium, and it is more qualitative than quantitative. Bacteria present in air currents are not detected by this method. The slit air sample provides more quantitative results, but the initial cost of the equipment is expensive. A less expensive technique is available in an all-glass impinger apparatus which is reported to be quite satisfactory. With this technique, air is passed through sterile saline solution or broth and quantitative determinations are obtained.

There is no standard of interpretation. The total number of colonies on a plate cannot serve as a true index, since it is only a rough estimate in view of the limitations of the collecting procedure. Laboratory workers should be familiar with the saprophytic forms that might be encountered in the area in question and should be able to differentiate them from potential pathogens, such as staphylococci. Although identification of all colonies obtained in a study of air in an operating room is expensive and laborious, in an epidemic it may be advantageous to make such a specific identification. Air counts may be used more profitably as a device to educate operating-room personnel in the proper techniques to be used in reducing the bacterial counts of the air. Since epidemic strains of staphylococci are carried in the upper respiratory tract of approximately 10% of hospital personnel, it may be more logical to detect epidemic strains in the carriers among the personnel rather than to search for them in cultures made of the air. To investigate the question of identification, phenolphthalein phosphate might be included in the mediums (Barber and others, *J. Path. & Bact.* 63:57, 1951). This method may be useful if the organism produces coagulase, since this will result in the formation of phosphatase which will split off the phenolphthalein from the phenolphthalein phosphate. Then, if the plate is held over fuming ammonia, the presence of coagulase-positive staphylococci will be shown by a pink color.

The role of the hospital laboratory in a program designed for the control of cross infections within hospitals is an important one. The bacteriologist is often one of the first persons to know of an epidemic situation and can assist in the collection of statistics, check the sterility of supplies, and check the adequacy of sterilization techniques. He is able to store cultures of staphylococci obtained from hospital-acquired infections. These could be of value in the event of an epidemic, since they could aid in determining the specific strain involved in the epidemic and in detecting carriers in the institution.

NEURITIS OF RECURRENT LARYNGEAL NERVE

To THE EDITOR:—*A 55-year-old woman has an idiopathic neuritis involving the left recurrent laryngeal nerve. Every conceivable test has been carried out to determine whether pressure could be exerted on the recurrent laryngeal nerve both in the throat and in the mediastinal region. However, all tests show absolutely negative findings, including tuberculin tests. She has apparently had this condition for two years; this would probably rule out the existence of mediastinal malignancy or a lymphoma. At the present time she is being treated for the resolution of a neuritis of the left recurrent laryngeal nerve. Her chief symptoms are hoarseness and periodic coughing, associated with laryngeal spasm. Surgical exploration of the mediastinal region has been considered. Please give further suggestions. What is the incidence of an idiopathic type of neuritis involving the left recurrent laryngeal nerve?*

S. W. Scorse, M.D., Joplin, Mo.

ANSWER.—A search for the cause of recurrent laryngeal nerve paralysis can sometimes be unrewarding, and the number of "idiopathic" cases has run as high as 30% in one large reported series. Toxic and inflammatory causes may account for an additional 15-20% of cases. In the situation under discussion, the duration of the condition would probably rule out the existence of any malignancy. Barium studies of the esophagus and planigrams of the chest and mediastinal areas might be suggested. If there are no findings other than the isolated paralysis, surgical exploration of the mediastinum would not seem justified in view of the above figures. Fortunately, most of the individuals with unilateral vocal cord paralysis of undetermined cause do develop a good voice eventually, and their coughing episodes and laryngospasm disappear. If voice reeducation is hampered by virtue of the position of the paralyzed cord in partial abduction, some type of plastic procedure can be performed to permit contact by the remaining mobile cord.

Answer.—There is no entity which can be regarded as idiopathic recurrent laryngeal neuritis. Instances occur in which hoarseness develops for no assignable reason, and it is sometimes the case that nothing can be found to explain the condition, either in local, peripheral, or central nervous system disease. It is possible that in an instance such as this the hoarseness may be the first manifestation of disease involving the vagus nucleus (nucleus ambiguus) in the medulla, due to a local cause or to amyotrophic lateral sclerosis. It is also possible that the symptoms may be the result of involvement of a branch of the posterior-inferior cerebellar artery. If there are no other findings beyond those of hoarseness, only time can determine the cause in the presence of negative findings in the present studies.

SILICA EXPOSURE AFTER TUBERCULOSIS

To the Editor:—*If it is possible to generalize, should a man who has had pulmonary tuberculosis adequately treated and whose disease has been declared arrested or cured be allowed to return to silica brick yard work where there is even minimal silica exposure hazard? Also, are there any absolute contraindications to prophylactic aluminum dust inhalation—disregarding the question of its value? Special reference is made to coronary artery disease, bronchial asthma, and arrested pulmonary tuberculosis.*

Fred H. McClain Jr., M.D., Mount Union, Pa.

Answer.—The answer to the first question would have been an emphatic "no" as recently as 10 years ago. It seems from more recent experience, however, that it is safe to allow workers with adequately treated and inactive tuberculosis to return to jobs where the silica dust hazard has been controlled. By "controlled" is meant that the amount of crystalline-free silica dust in the atmosphere is at all times less than 5 million particles per cubic foot (for particle sizes of less than 10 μ). This must be calculated from the total dust count by knowing the free silica content or percentage of a given dust. Numerous U. S. Public Health Service surveys have shown that a recognizable silicosis will not occur in the working lifetime if the silica dust exposure is kept below that figure. Other studies have shown that silica dust exposure per se does not appear to have a deleterious effect on tuberculosis. Sufficient cellular reaction to the silica to be recognizable by chest x-ray studies must have occurred before the reactivating effect becomes apparent. However, where there is any doubt about the silica dust control, the answer to this question still is "no." When such a worker is returned to a job which has good dust control, it is advisable to continue treatment with tuberculosis drugs indefinitely.

The answer to the second question also must be qualified. There is no evidence that aluminum dust would have a harmful effect on coronary artery *disease, but experimental animals with low virulence* tuberculosis have shown slight progression of the disease after aluminum inhalation. There have been only rare cases of such progression in humans. As for bronchial asthma, there has been no recorded experience to this consultant's knowledge. If the proponents of the use of prophylactic aluminum dust are correct in their theory that aluminum inhalation tends to relax bronchospasm, then there should be a beneficial rather than harmful effect with bronchial asthma. Proof of this is lacking, however.

SYMPTOMS OF HYPOGLYCEMIA

To the Editor:—*A thin, 38-year-old man has had spontaneous hypoglycemia since 1951. His blood pressure is 110/72 mm. Hg. Basal metabolic rate is —8% and protein-bound iodine level 5 mcg. per 100 ml. Glucose tolerance findings were as follows: fasting, 110 mg. %; 30 minutes, 60 mg. %; one hour, 60 mg. %; two hours, 58 mg. %; three hours, 64 mg. %; four hours, 68 mg. %; and five hours, 72 mg. %. No sugar was present in the urine. Symptoms of mental confusion, slow mentation, lightheadedness, and negativeness were noted 15 minutes after the glucose tolerance test was begun. These symptoms also occur throughout the day every day and are completely, though temporarily, relieved by ingestion of carbohydrate. One sister has renal glycosuria. A 50-Gm. carbohydrate diet and six feedings per day have not relieved the symptoms. Please suggest further treatment.*

Frank H. Hamilton Jr., M.D., Charlotte, N. C.

Answer.—The questioner does not state the method of blood sugar level determination which was used. If this was the Folin-Wu method or one yielding similar results, then the fasting blood sugar value is within normal limits, although it is a trifle higher than the average. Other values are at a level which might give rise to symptoms of hypoglycemia in a sensitive individual. If the values were obtained by the Somogyi-Nelson or a comparable procedure, then the fasting value is at the upper limit of normal and consistent with "mild" diabetes. The other values are at levels which ordinarily would not give rise to hypoglycemic symptoms. It would be worth knowing at what time during the period of symptoms (which date back to 1951) the glucose tolerance test was done. Was more than one glucose tolerance test carried out, and, if so, were the results quoted typical of those obtained in other tests? Taking the findings in the glucose tolerance test at their face value, one would be doubtful of the presence of an islet cell tumor. The level after an overnight period of fasting is somewhat above, rather than much below, the average normal, and in the third, fourth, and fifth hours after glucose is given there is a steady, though slight, tendency for the blood sugar level to rise spontaneously. It would appear that in this patient the pancreas is unusually responsive to the stimulating effect of carbohydrate. Certainly a low-carbohydrate, liberal-protein diet is indicated with the amount of fat at that level necessary to maintain proper body weight. It is possible that, with frequent administration of carbohydrate during the day to relieve symptoms, the actual amount of carbohydrate taken in 24 hours is much more than the 50 Gm. stated. No mention is made as to whether hypoglycemic episodes have occurred during the night or in other periods of fasting. Unless these have already been carried out, the following measures are suggested: (1) repetition of the glucose tolerance test; (2) observation of the behavior of the blood sugar level after a prolonged fast, up to 24 hours (this could be done by determining the blood sugar level after an overnight period of fasting, continuing to withhold food, and measuring the blood sugar level every two or three hours until a full 24-hour fast has been accomplished); (3) attempts to relieve hypoglycemic episodes by the ingestion of food predominately protein rather than carbohydrate in content; (4) use of daily medication with belladonna and phenobarbital in appropriate doses; and (5) ruling out causes other than hypoglycemia which might be responsible for the symptoms.

TRANSFIXING LUMBOSACRAL JOINTS

To the Editor:—*What is the current feeling about the use of screws through the zygoapophysial junctions of L-4 and L-5, L-5 and S-1, and S-2 to stabilize the lumbosacral spine?*

C. J. Kilduff, M.D., Lancaster, Pa.

Answer.—The use of screws to transfix the facet joints in the lumbosacral area of the spinal column in conjunction with spinal fusion has been accorded some favor during the past 10 years. Reliable qualified orthopedists have used this method and reported their technique. Adequate follow-up studies, which include the use of other techniques as a control, have not yet been published, so far as is known. Thus, evaluation of the use of screws to stabilize this portion of the spinal column as an adjunct in spinal fusion remains difficult. However, in general, the practice appears to be declining, even among those who advocated it originally. Certain complications have arisen, such as impingement of the transfixing screw on the underlying nerve root as well as the usual complications involved in introduction of a foreign body, such as metal, into bone. At best, the use of screws in this manner would be an adjunct to spinal fusion. The screws cannot fix the spinal column rigidly and would function only as a mechanical aid for bone grafts, placed in one of many ways possible, to become solid.

FOOTBALL FOR FOURTEEN-YEAR-OLD BOYS

To the Editor:—*What is the present consensus on 14-year-old boys playing regular football, as opposed to 6-man football, while they are in high school? Some believe that 11-man football should not be played at all in high schools because of the frequency of epiphysial and joint injuries, since the bones are still growing and since an epiphysial injury may well cause retardation of growth in the involved extremity. The particular boy under consideration is in excellent health but is lighter than the average, weighing about 110 lb. (49.9 kg.). He wants to play in the backfield because of his extreme speed, but it is felt that a fast runner being tackled is more likely to receive injuries than a lineman.*

M.D., New York.

Answer.—If the statistics for particular phases of the game are checked, it will be noted that tackling or being tackled accounts for high incidence of the injuries. Comparison of 11-man and 6-man football as far as injury incidence goes indicates that there are fewer sprains, strains, and bruises in the 6-man game but more fractures and other serious injuries. The 6-man game tends to be more open in nature, but the element of tackling still remains and greater momentum is attained. The boy mentioned in the question is certainly not heavy in comparison to some of the players with whom he might compete in high school. Whether such players are carefully matched in terms of age, height, and weight for their play is important in this framework. There has been much dispute about the hazard to the growth areas of the long bones during adolescence in relation to contact sports, particularly football. Different surveys among orthopedic surgeons have elicited varying replies. While there is no dispute about the hazard, many feel that the supervised situation in high school is safer than the sandlot activities in which the interested boy may participate if he is excluded from school participation. The question as to whether a 14-year-old boy, presumably a ninth grader, should participate in tackle football involves more than a few issues. A few years ago, Dr. Thomas Shaffer made a study relating to the evaluation of the high school athlete for participation. He feels that maturity is a vital consideration in such an appraisal.

REGIONAL ILEITIS AND PREGNANCY

To the Editor:—*A 24-year-old woman has a history from early childhood of three or four daily bowel movements with mucus but no blood or cramps. One and a half years ago it was noted that she had lost weight, and on examination anemia, elevated sedimentation rate, and a mass about the diameter of a grapefruit in the right lower quadrant were noted. X-ray studies revealed a fistula in the right lower quadrant connecting the rectosigmoid, the cecum, and a loop of distal ileum. A narrow sinus tract about an inch long, ending blindly, and probably originating from the sigmoid was also noted in the left lower quadrant. Two or three small diverticula were also noted in the sigmoid and descending colon. It was noted on fluoroscopy, with barium enema, that the barium entered the cecum and loop of proximal ileum prior to entering the sigmoid. It was noted on upper gastrointestinal studies that barium entered the rectum within one and one-half hours. The diagnosis of regional ileitis with fistula involving the terminal ileum, cecum, rectosigmoid, and a more proximal loop of distal ileum was made, and operation was considered. However, the patient became pregnant at this time with her first baby, and the decision was deferred. She had an uneventful pregnancy, and during her pregnancy and since then she has had no diarrhea except for occasional mild episodes on aggravation. Her weight level, hemoglobin value, and state of well-being are well maintained. A repeated barium enema (done one year after the original studies) showed the same findings, and the mass in the right lower quadrant has remained about the same size. Is it advisable to perform operation with resection at the present time with a view toward avoiding future flare-ups of the disease and further complications, or should the conservative approach of watchful waiting be taken?*

M.D., New York.

Answer.—If the story had ended prior to the patient's pregnancy, operation would have been the treatment of choice—resection of the distal ileum, separation of the fistula from the sigmoid, and removal of the diseased segment of intestine. It appears that, during pregnancy, there has been a good deal of healing of the inflammatory process in and about the ileum and that the patient is now considerably improved from the standpoint both of her general well being and of her weight and her hemoglobin level. However, the presence of the mass indicates that she still has considerable difficulty. Because of the risk at operation and the high incidence of recurrence of ileitis in this type of individual, the conservative approach of "watchful waiting" is entirely justified. However, if further signs of activity in the fistulous tract occur, resection should be reconsidered.

1918 INFLUENZA EPIDEMIC COMPARED TO ASIAN INFLUENZA EPIDEMIC

To the Editor:—*Please give information on the clinical differences between the European type of influenza (epidemic after World War I) and the Asian type. Are there more cases of nervous disorder—spinal, Parkinsonism, or encephalitis lethargica—with the Asian type of influenza than with the European?*

Gottwald Schwarz, M.D., New York.

Answer.—Compared to the A/Swine influenza pandemic of 1918, the A/Asian influenza pandemic resulted in relatively few fatalities. Excess mortality for influenza and pneumonia in the United States was actually less than that for several other influenza epidemics in the decades since 1918. No other pandemic or major epidemic of influenza has been so severe in terms of mortality as that of 1918. Debate still continues as to whether the deaths in 1918 were due primarily to the virus itself or to secondary bacteria. In 1957 and 1958, only a small number of deaths were clearly due to the virus alone. These deaths were caused primarily by severe hemorrhagic tracheobronchitis and/or pneumonia. The majority of the 1957-1958 influenza-associated deaths were caused by complicating bacterial pneumonia. Most nonfatal cases of Asian influenza were not very different from nonfatal influenza cases in 1918. Symptoms in both pandemics were essentially the same. Fever, headache, malaise, myalgia, cough, and sore throat were most often reported. There appear to have been more severe cases of primary viral hemorrhagic tracheobronchitis and pneumonia and more complicating bacterial pneumonias resulting in death in 1918 than in 1957-1958. Whether most deaths were due to the virus itself or to bacteria is uncertain. In both pandemics, small numbers of cases of influenza encephalitis were reported. More appear to have been reported in 1918, but confirmation was not as possible in such cases then as it is now. It is likely that the A/Swine virus caused no more or no less encephalitis than the A/Asian strain. Encephalitis lethargica (Economo's disease) was something quite different and apparently unrelated to A/Swine influenza, although it did become world-wide after the influenza pandemic in the period just before and after 1920.

SALIVARY GLAND TUMOR

To the Editor:—*A small tumor located right at the anterior capsule near the bone was removed, with the facial nerve and some of parotid gland left. Four days after operation the pathologist reported the tumor to be a mucoepidermoid carcinoma in the upper grade of malignancy with a tendency to metastasize. The patient is over 72 years of age. Is surgery indicated? Should the whole parotid gland have been removed and the facial nerve cut? Should x-ray treatment be given?*

M.D., Georgia.

Answer.—Several general principles are applicable when the surgeon is confronted with a swelling or tumor mass of unknown nature in the parotid area. First, he should consider that the tumor is possibly, as it was in this case, carcinomatous. Second, it should be recognized that, in their early stages, some malignant tumors give no clue that they are in fact malignant. The surgery should be designed to encompass the tumor with a surrounding mass of normal salivary gland tissue. If this can be accomplished without injury to the facial nerve it will suffice in many instances. If this was done in the case reported, this consultant would recommend no further treatment at this time. Most salivary gland tumors are moderately radiation-resistant, and it is not advisable to use x-ray therapy as a routine postoperative measure.

DEGENERATION OF THE TEETH

To the Editor:—*Is there any beneficial effect of the combined use of estrogens and androgens for treatment of degeneration of teeth? Mainly, is such treatment as effective as in osteoporosis of senility in the laying down of new bony matrix?*

Murray Russell, M.D., Garden Grove, Calif.

Answer.—It is assumed that "degeneration of teeth" refers to the loss of supporting alveolar bone as is seen in periodontal disease. If this is so, there is no indication in the literature or elsewhere that the use of estrogens and androgens would be of any value in restoring the destroyed supporting bone.

IODINE AND ACNE

To the Editor:—*In a high school health textbook, a footnote says, "Teenagers who have pimples should avoid iodized salt." Is there a medical basis for such a statement?*

Fred H. Wiechman, M.D., Jacksonville, Fla.

Answer.—Most dermatologists agree that there is a medical basis for this statement. Iodine in itself may cause an acneiform eruption. It is recognized that often the ingestion of iodine results in the exacerbation of a preexisting acne vulgaris. This is believed to be due to the excretion of the iodine through the skin with irritation of the pilosebaceous apparatus, a structure which might be termed the "shock-organ" in acne vulgaris. Iodine may enter the system from sources other than iodized salt. Some of the more common ones include fish and sea foods, medication taken internally or applied locally, vegetables grown in a soil with a high iodine content, or drinking water. Many patients' acne gets worse when they move to the sea coast because of the latter source of iodine. Bromine has the same deleterious effect on acne as does iodine, but the other halogens, chlorine and fluorine, do not cause an aggravation of this condition.

TREATMENT OF MILIA

To the Editor:—*An 18-year-old girl has what she thinks is acne. Actually, she has a good many milia (whiteheads) rather than comedones. These were small and primarily over the malar region. In addition, she had a few scaly-appearing seborrheic areas. Her face was rather oily. She had no dandruff particularly. What medicament would be effective in the treatment of these whitish small papules? Incidentally, these are rather firm and do not secrete fluid of any kind. Would dermal abrasion be justified?*

M.D., Alabama.

Answer.—Planing frequently causes the formation of milia itself, so this treatment would not be indicated in this patient. Dermal abrasion does not extend sufficiently deep to remove the adnexa of the skin. Deeper planing may result in scarring that would be more objectionable than the "whiteheads" and more difficult to eradicate. The best treatment for this condition is a tedious one, involving needling of each milium under sterile technique and expressing the contents carefully and completely with a comedone extractor. Treatment of the seborrheic areas with a 3% sulfur precipitate and 3% salicylic acid cream would be indicated also.

RECURRENT INFECTIOUS MONONUCLEOSIS

To the Editor:—*Have there been any reported cases of infectious mononucleosis occurring a second time—not as a recurrence of the initial illness—in the same person? Could infectious mononucleosis be followed or accompanied by infectious hepatitis?*

M.D., Illinois.

Answer.—The degree of immunity conferred by an attack of infectious mononucleosis is undetermined. However, even in communicable diseases known to produce a strong immunity after an attack, occasionally second attacks do occur in certain individuals. The mechanisms of bacterial or viral synergism or interference are not too well known, but the coexistence of two infectious diseases is, in general, a rare event. Liver involvement, with or without jaundice, occurs in a high proportion of patients with infectious mononucleosis, as shown by abnormal results in liver function tests. The possibility of confusing infectious mononucleosis with infectious hepatitis is especially likely in view of the lymphocytosis which frequently accompanies the latter disease.

ASTHMA AND SEDIMENTATION RATE

To the Editor:—*A patient has an erythrocyte sedimentation rate of 30 mm. per hour. He has had bronchial asthma and some bronchiectasis for several years. As far as can be determined, there is nothing to indicate an infection anywhere. Could the presence of asthma and/or bronchiectasis account for the increased sedimentation rate?*

Clyde K. Walter, M.D., Canfield, Ohio.

Answer.—On the basis of the facts presented, all that can be said is that the erythrocyte sedimentation rate of 30 mm. per hour (assuming that the test was performed by the Westergren technique) could be accounted for by the diseases mentioned, although the moderate elevation may be caused by some other process. Chronic, nonextensive bronchiectasis and asthma as a rule do not cause increases in the sedimentation rate, but during exacerbations the rate frequently increases.

IMMUNOLOGY OF SMALLPOX VACCINATION

To the Editor:—*What is the mechanism of protective action of vaccination against smallpox? Is it a system of antibodies or some other effect of the cowpox vaccine?* *M.D., Illinois.*

Answer.—The relationship between the viruses of smallpox, alastrim, vaccinia, cowpox, and ectromelia is a close one, and a great deal of cross protection, sometimes complete, occurs between them. No difference is detectable between smallpox and alastrim. Vaccinia virus closely resembles smallpox virus, while cowpox virus, on the other hand, is more closely related to the virus of ectromelia. It seems probable that the present strains of vaccinia virus are derived from smallpox rather than from cowpox. The immunological mechanisms of protection are the usual ones, consisting of neutralizing virucidal antibodies and agglutinins, precipitins, and complement-fixing and antihemagglutinating bodies.

CHLOROPHYLLINS

To the Editor:—*Are chlorophyllins harmful in any way?* *M.D., Alabama.*

Answer.—Chlorophyllins are water-soluble derivatives of chlorophyll, the green coloring matter of plants. They are prepared commercially by saponification of a source of chlorophyll, such as alfalfa, and by replacement of the magnesium present in the original chlorophyll molecule by another metal, usually copper, to give a more stable compound. The chlorophyllin used in deodorant preparations and described as potassium sodium copper chlorophyllin apparently is not a pure product. The question has been raised as to whether the copper present in this preparation is a potential source of toxicity. However, the copper in the complex is so firmly bound to the chlorophyll moiety that metallic poisoning would not occur unless an excess of copper were present.

PREGNANCY AND BREAST CARCINOMA

To the Editor:—*Are further pregnancies contraindicated in a woman who has had carcinoma of the breast, duct type, for which radical mastectomy of the left breast and simple mastectomy of the right breast were done?*

R. A. Bussabarger, M.D., Raymond, Wash.

Answer.—There are some surgeons and roentgenologists who believe it is dangerous for a woman who has had an operation for carcinoma of the breast to become pregnant again. The reason for this is that in several instances pregnancy and/or lactation seemed to have induced recurrences. However, this consultant believes that, if this patient remains well for three years without evidence of recurrence or metastases, she may bear more children.

TYPHOID BOOSTER IMMUNIZATIONS

To the Editor:—*How often is an intradermal typhoid-paratyphoid booster dose needed after an initial series of three 0.1-cc. injections at weekly intervals?*

W. M. Fowlkes Jr., M.D., Wendell, N. C.

Answer.—An intradermally given booster dose every three years is sufficient under "normal" circumstances. However, persons exposed to heavy risks of infection, i. e., living in areas where typhoid is endemic, should get a booster injection every year.

SMOKING AND VITAMINS

To the Editor:—*What is the effect on vitamin metabolism, especially that of the vitamin B complex group and vitamin C, in the human body in an individual who smokes and inhales 20-40 cigarettes a day?*

W. Forrester Maley, M.D., Chicago.

Answer.—This consultant is unaware of any evidence indicating that cigarette smoking has an adverse effect on the body's ability to utilize vitamins.

SUBJECT INDEX

The letters used to explain in which department the matter indexed appears are as follows: "E," Editorial; "C," Correspondence; " abstracts; the asterisk (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word with the following exceptions: Foundations, Lectures, Pictures, and Prizes, under "F," "L," "M," and "P" respectively. "Book Reviews," "Deaths," "Medicolegal Abstracts" and ." are indexed under these titles at the end of the letters "B," "D," "M," and "S." Matter pertaining to the Association indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

For the author index see page 48.

A

H: See Corticotropin
, APC; ARD VIRUSES: See Adenovirus
: See Adenosinetriphosphate
MEN
  "flat film" of, what does it mean? (reply) [Lamm] 1151—C
  generalized, and acute renal failure, (Diagnostic Problems) [Kushner & Szanto] *1778
  pain, upper, esophagitis as cause of, [Bernstein & others] *27
  patient lies on to prevent spinal-tap headache, [Brocker] *261; (correction) 913
  surgery, hypothermia in; light cooling with anesthesia in poor risk patients, [Brewer] 1588—ab
  surgery, routine laparotomies, complications, especially spontaneous pneumothorax, 2083
  surgery, transverse incision in colon and rectum surgery, [Trimpi] 2307—ab
  surgical condition, systemic lupus erythematosus simulates, [Pollak] 1701—ab
BILITIES, INC.
  competitive industrial activity effects on severely disabled cardiac patients, [Slipyan] *147; 190—E
NORMALITIES
  congenital, production by diet, experiments in mammals, (Council article) [Warkany] *2020
  fetal, origin of; case of rare monster, [de Gennaro] 2313—ab
ORTION
  induced, Sweden, 1391
  prevention, Brazil, 2167
  therapeutic, Denmark, 920
  threatened, does progesterone have adverse effect on fetus in case of? 473
  threatened, effect of vibration on, 474
SCESS
  brain, 47 cases, [Kerr & others] *868
  breast, maternal; and antecedent neonatal staphylococcal infection, [Monro] 1275—ab
  formation in pneumonia in infants, therapy, [Bucha] 222—ab
  gas in pancreas as sign of, [Agnos] 914—ab
  injection, due to Candida albicans, [Eriksen] 837—ab
  lung, postpneumonic, lobectomy in infancy and childhood for, [Moore] 2308—ab
  staphylococcic empyema, [Magovern & Blades] *365
SENTEEISM: See Industrial Health, workers
CIDENTS
  Automobile: See Automobiles
  burden on hospitals, report on A. M. A. bulletin, 1080
  in childhood, survey, [Fowler] 1820—ab
  in school children account for almost half of their death rate, Mich., 419
  Industrial: See Industrial Accidents
  mortality, report on, 1142
  Poisoning: See Poisoning
CREDITATION: See also Hospitals, accreditation; Joint Commission on Accreditation of Hospitals
  program for schools of nursing, report, 58
ENOCOUMAROL
  clinical evaluation, [Rullo & others] *743
ETAZOLAMIDE
  action on blood vessels, India, 1800
  toxicity, hepatic coma from, in cirrhosis, [Rissel] 2301—ab
  treatment of chronic glaucoma, [de Carvalho] 314—ab
  treatment of edema of pregnancy, [Morra] 2070—ab
  treatment of epilepsy in children, [Holowach] 935—ab
ETOPHENETIDIN
  toxic agent in etiology of leukemia, [Scheuer-Karpin] 1265—ab
ETYL SULFAMETHOXYPYRIDAZINE
  N. N. D., 1772
CETYLCHOLINE
  content of intestine, India, 1925
CETYLSALICYLIC ACID (Aspirin)
  antipyretic effect of salicylamide compared, toxicity, (replies) [Woodbury] 1259—C; [Bass] 1684—C
ACETYLSALICYLIC ACID—Continued
  effects on prothrombin during concurrent use with anticoagulants, 1168
  poisoning, accidental, control of, [Cann & others] *717
ACHROMYCIN: See Tetracycline
ACID: See under name of specific acid as Acetylsalicylic Acid
ACIDOSIS
  hyperchloremic, in chronic pyelonephritis, [Lathem] 215—ab
  respiratory, recognition and management, (illustrated film review) [Smart & others] *2051
ACNE
  etiology: methylprednisolone, [McMahon & Gordon] *1208
  in adolescent girls, treatment, 983
  iodine and, 2333
ACRODYNIA
  mercury absorption relation to, 138
ACRYLIC SUBSTANCE
  lens operation, 1838
ACTHAR: See Corticotropin
ACTIVITY
  physical, fat intake, and blood coagulation, United Kingdom, 1682
Ad Hoc Committee: See American Medical Association
ADAMS, DUNCAN D., Van Meter Prize to, New Zealand, 1570
ADAMS COUNTY Medical Society, Quincy, Ill., offer prizes to teenagers with high scholarship, [Medicine at Work] 1891
ADAMS-Stokes Syndrome: See Heart, block
ADDISON'S DISEASE
  chronic, [de Andino] 1405—ab
  treatment, current status, (Council report) [Thorn & others] *2130
ADDRESS, change of, for mailing A. M. A. JOURNAL, 32; 193; 292; 2147—E
ADENOCARCINOMA
  primary, of ampulla of Vater, [Hayden] 218—ab
ADENOIDAL-PHARYNGEAL-CONJUNCTIVAL VIRUS: See Adenovirus
ADENOIDECTOMY
  mouth breathing indication for? 362
ADENOMA
  bronchial (carcinoid type), with solitary metastasis and carcinoid syndrome, [Stanford] 838—ab
  hypophyseal, surgery plus preoperative and postoperative adrenocortical hormones for, [Decourt] 434—ab
  pulmonary adenomatosis, symptomatology and [illegible]—ab
[illegible]
[illegible] 431
[illegible] :D; RI)
[illegible] ung adults, comments on vaccination, [Evans] 2077—ab
  interstitial plasma-cell pneumonia caused by one? [Vivell] 1412—ab
  outbreak of pharyngoconjunctival fever caused by types 3 and 4, [van der Veen] 2077—ab
  vaccine, bivalent types 4 and 7, second field evaluation, [Hilleman] 2301—ab
ADHESIONS
  intraperitoneal, experimental study, [Jackson] 2065—ab
ADOLESCENCE: See also Puberty
  doctors foster scholarship among teenagers, [Medicine at Work] 1891
  football for 14-year-old boys, 2331
  hypertrichosis and acne in girls, treatment, 983
  teen-age clinics, 288—E
ADRENALIN: See Epinephrine
ADRENALS: See also Addison's Disease; Cushing's *Syndrome*
  calcification, significance and therapy in 3-year-old, (reply) [Goldzieher] 1170
  cancer with excessive aldosterone production in child with Cushing's syndrome, [Jackson] 1701—ab
  chronic cortical insufficiency, [de Andino] 1405—ab
  cortex, familial congenital hyperplasia of, [Birke] 2182—ab
  cortex, hyperfunctioning lesions, adrenalec*tomy for,* [Ellison] 112—ab
ADRENALS—Continued
  excision in breast cancer; correlate clinical results with estrogen production, [Bulbrook] 948—ab
  excision in Cushing's syndrome, management and metabolic aspects, [Mason] 2308—ab
  excision, inverted electrolyte response following, [Llaurado] 826—ab
  excision plus ovariectomy in metastasizing mammary cancer, [Hellström] 829—ab; [Davis] 2306—ab
  hypofunction after corticoid withdrawal, [Vermeulen] 1406—ab
  mammary cancer and, Portugal, 2170
  preparations mask intoxication, interpret tests, (Committee report) [Turner & others] *1359
ADRENOCHROME MONOSEMICARBAZONE: See Carbazochrome
ADRENOCORTICOTROPIC HORMONE: See Corticotropin
ADRENOXYL: See Carbazochrome
ADVERTISING
  medical journal, A. M. A. resolution on, 69
  over-the-counter medications, report on A. M. A. action on, 57
  proprietary drugs, (A. M. A. resolution on) 68; (annual report on) 1052
ADVISORY panels and expert witness, [Sadusk] *2121
AEROPHAGIA with eructation, treatment, 1734
AFIBRINOGENEMIA: See Blood fibrinogen
AFRICA, cancer in, United Kingdom, 928
AGAMMAGLOBULINEMIA: See Gamma Globulin
AGAVE, pneumoconiosis from, [Baader] 1721—ab
AGE
  effect on serum mucoproteins and hexosamine, [Schwartz] 975—ab
AGGLUTININS
  cold, elevated, in child with hemolytic and hypochromic anemia, (Diagnostic Problems) [Kushner & Szanto] *1013
AGING: See Old Age
AIR
  borne ions, negative, inhalation proposed for asthma, hay fever, and other conditions, 1059
  cysts, postpneumonic pseudo, in children, [Schlager] 1817—ab
  flow resistance, effect on ventilation and respiratory muscle activity, [Fink & others] *2245
  "plates" and control of hospital infections, 2329
  pollen sampling stations, N. Y., 910
  pollution and lung cancer, Belgium, 2167
AIR FORCE: See Aviation, U. S. Air Force
AIRPLANES: See Aviation
ALABAMA
  community medical rating survey, (Council survey) 1378
  placement survey, doctors and communities rated in, [Medicine at Work] 777
ALBAMYCIN: See Novobiocin
ALCOHOL
  driving and, United Kingdom, 2175
  gasserian injection for tic douloureux, [Ecker] 119—ab
  in Blood: See Blood
  induced pain in Hodgkin's disease, [Braun & [Schnider] *1882
  sensitivity in Hodgkin's disease, [Tweeddale] 1812—ab
  vaporized, fire hazards, (reply) [Kneedler] 984
ALCOHOLISM
  acute and chronic, serum transaminase activity in, [Bang & others] *156
  A. M. A. Committee on, annual report, 1053
  chemical tests for, annual report, 1046
  deficiency *encephalopathies* in, [Lapresle] 827—ab
  fight against, fellowship centers and outpatient clinics, [Medicine at Work] 1895
  handwriting, speech and behavior changes in, (Committee report) [Bogen] 48
  interpret tests for, (Committee report) [Turner & others] *1359
  legal validity of breath tests, Canada, 2290

ALCOHOLISM—Continued
Ontario Alcoholism Research Foundation reports, 1679; 2291
psychoses in, Sweden, 2294
"scrap iron" intoxication, [Gadsden & others] *1220
treatment, adjunctive, hallucinogenic drugs, [Smith] 2068—ab
treatment, citrated calcium carbimide, [Mitchell] *2008
treatment, disulfiram; toxic effects, [Rathod] 2068—ab
treatment of delirium tremens, hydroxydione sodium succinate, Sweden, 1801
treatment, promazine, arterial thrombosis with gangrene after, [Opinsky & others] *1224
ALDINAMIDE: See Pyrazinamide
ALDOSTERONE
production, excessive in child with adrenocortical carcinoma and Cushing's syndrome, [Jackson] 1701—ab
ALDOSTERONISM
correlate hyperaldosteronism and cardiovascular congestive decompensation, [di Perri] 975—ab
primary, vs. primary renal hypokalemia, [Alsted] 1578—ab
treatment, current status, (Council report) [Thorn & others] *2130
ALESON COMMITTEE report, A. M. A. action on, 2149
ALIDASE: See Hyaluronidase
ALKALI
therapy with PAS, 2082
ALLERGY
alcohol, in Hodgkin's disease, [Tweeddale] 1812—ab
anaphylaxis during general anesthesia impossible? 1958
antibiotic, [Herrell] *1875
awards to medical students, 298
cause of progressive myopia? 1837
conjunctivitis, percentage of epinephrine absorbed systematically from eye, 1832
desensitization, especially against horse serum, 843
dog dander and asthma, (replies) [Howard: and original consultant] 1170
expand Duke University's training program, 420
hard-shelled clams, 982
hazards of therapy in respiratory disease, [Sherman] *1866
house-dust, respiratory: clinical entity in pediatrics, [Mande] 1720—ab
nickel desensitization, method, 1731
[illegible]le? 1295
[illegible]el, 2044
[illegible] study, (reply) [Cooper] 519—C
penicillin in poliomyelitis vaccine, sensitivity to, United Kingdom, 2046
penicillinase, 2207
seasonal allergic rhinitis, incidence of complications after antihistamine therapy compared to hyposensitization, 2208
sulfamethoxypyridazine, cutaneous reactions, [Lindsay] 2073—ab
tranquilizing drugs, [Hollister] 964—ab
wheal at tuberculin P. P. D. test site associated with asthmatic attack, 1424
ALOPECIA
etiology: dextran sulfate, United Kingdom, 167:1029, June 21, 1958; (correction) 168: 81, Sept. 6, 1958
etiology: nylon, United Kingdom, 1928
etiology: warfarin sodium, 1169
of beard in multiple sclerosis, 1423
thinning of hair in women, cause, treatment, 137
universalis with nail changes, treatment, prognosis, 1837
ALSEROXYLON: See Rauwolfia serpentina
ALTITUDE
high, study of pregnancy at, 299
ALUDRINE: See Isoproterenol
ALUMINUM
hydroxide and dietary phosphorus, 1838
AMBLYOPIA
dissolving corneal opacities in 79-year-old woman with diabetes, 138
ex anopsia, prognosis, glasses indicated? 1732
tobacco, and vitamin B_{12}, United Kingdom, 435
AMEBIASIS
broad-spectrum amebicide, Brazil, 1254
rectum biopsy in diagnosis of amebic colitis, [Juniper] 127—ab
treatment: bacitracin, India, 1926
treatment: phenanthrolinequinone derivatives, India, 803; (11,925) 1680
AMENORRHEA
secondary, and oligohypomenorrhea, incidence of spontaneous cure, [Westman] 2313—ab
AMERICAN: See also list of Societies at end of letter S
Academy of Neurological Surgery, meeting report, Canada, 2292
AMERICAN—Continued
Association for Advancement of Science publishes proceedings of A. M. A. symposium on human integument, 1062
Bar Association, (A. M. A. liaison committee, report of) 57; 1043; (comments on film, "Man Who Didn't Walk") [Medicine and the Law] 72
Boards, (restrictive effect of certification on medical practice, A. M. A. resolution on) 65; (requirements for certification, annual report) 658; (A. M. A. resolution on creation of Board of General Practice) 897
citizens, basic medical rights of, A. M. A. resolution on, 69
Dietetic Association, A. M. A. co-sponsoring committee on gastrointestinal dietary therapy with, 1058
Drug Manufacturers Association, Liaison Committee of, A. M. A. report on, 1073
Hospital Association (A. M. A., liaison committee report) 57; (recommends all hospitals set up joint conference committees) 1233; (guides for health services in hospitals by A. M. A. and) [Felton] *1854
looks at National Health Service, United Kingdom, 317
Medical Directory, (circulation, annual report on) 1083; (20th edition available) 1232; (revision of categories) 1901
Nursing Home Association, A. M. A. liaison, annual report, 1115
Optometric Association wants amendment to Social Security Act, 2 A. M. A. letters to Congress on, 291
retirement plan, A. M. A. action on, 56
School Health Association presents Howe Honor Award to Dr. Bauer, 1663
surgeons visit Oslo, Norway, 310
urology's obligation to the world, [Barnes] *750
AMERICAN MEDICAL ASSOCIATION
activities in second half of 1958, highlights of, (President's page) 1786
ad hoc Committee on Atomic Medicine and Ionizing Radiation, new, 56; 1059; [Medicine at Work] 1370
ad hoc Committee on Medical Services for Construction Projects, guide, 1067; 1901
American Bar Association liaison, (report) 57; (comments on film: "Man Who Didn't Walk") [Medicine and the Law] 72
American Hospital Association liaison, 57; (guides for health services in hospitals) [Felton] *1854
American Nursing Home Association, Liaison Committee, annual report, 1115
annual and clinical meetings, places and dates, 63; 1039
Annual Congress on Medical Education and Licensure, (annual report on) 1090; (lifelong study is keynote) [Medicine at Work] 1369; 1899
Annual Reports, October 25, p. 1039
Association of American Medical Colleges liaison, 1471
Atlantic City meeting, 1959, (program plans) 1553; (section meetings) 1901
award to CBS for broadcasts of San Francisco meeting, (photo) 193
Awards and Citations at San Francisco Meeting, 53; (for Scientific Exhibits) 900; 1073; (to Mrs. Sewell) 1054
Board of Trustees, (attendance of immediate Past-President at meetings, resolution on) 70; (annual report) 1039; (endorsed liaison with medical schools) 1232; (endorsed recommendation for hospital joint conference committees) 1233; (Dr. W. L. Ball appointed to) 2150
Bureau of Medical Economic Research, (voluntary health insurance for retired persons) [Polner] *194; (reviews book on medical care) [Bornet] *2025
Business Manager, report, 1081
bylaw changes regarding Scientific Assembly, 1117
Commission on Medical Care Plans, (societies getting Part 2 of final report of) [Medicine at Work] 1367; (report on) 2149
Commission on National Emergency Medical Care Plan, evaluate task force material in study, [Medicine at Work] 773
committee appointments, 53
Committee on Federal Medical Services, VA insurance cases, 905; 2150
Committee on Indigent Care, plans study of state programs, [Medicine at Work] 1893
Committee on Influenza, announcement, 1234
Committee on Injury in Sports, safety in sports, [Medicine at Work] 774
Committee on Insurance and Prepayment Plans, new, [Medicine at Work] 1370
Committee on Maternal and Child Care, Conference on Perinatal Mortality and Morbidity Study Programs, 1554
AMERICAN MEDICAL ASSOCIATION—Continued
Committee on Medical Care for Industrial Workers, (preliminary guide for measuring work absence) 904; 1066; 1112; 1230 (survey of union health centers) 904; 1066; 1112; 1234; (study mobile employee health units) 1898
Committee on Medical Rating of Physical Impairment, visual system, 414-E; (report) *475
Committee on Medicolegal Problems, (handwriting, speech, and behavior changes in [illegible] pret tests for intox[illegible]ers] *1359
[illegible] for General Practice, progress report submitted by, 1494
Committee to Study A.M.A. Objectives and Basic Programs, A.M.A. action on, 63; 2149
constituent member, application of Virgin Islands Medical Society, 55
cooperation with Sears-Roebuck Foundation, brochure on Business Side of Medical Practice, 818; 935; 1155; 1262; 1401; 1691; 1806; 1932; 2050; 2176; (annual report) 1114
Council on Drugs, symposium-panel on use and abuse of adrenal steroids, program, 41
Council on Foods and Nutrition, (symposium on factors involved in formation and disease of bone, program) 520; (announce clinical nutrition fellowships) 768; (symposium on nutrition in pregnancy) [Stearns] *1655; [Hepner] *1774; [Warkany] *2020; [McGanity & others] *2138; [Macy] *2265
Council on Industrial Health, (asked permission to set up Committee for Classification of Pneumoconioses) 1067; (guide for medical services for construction projects) 1067; _1901_
Council on Medical Education and Hospitals, (report on residencies and internships approved) 58; (directory of approved internships and residencies) 521; 694-E; (Dr. Blish appointed to field staff) 695; (annual report on medical education) 1459 (supports development of additional facilities for basic medical education) 1470
Council on Medical Service, (Dr. Mulholland resigns) 55; (action on report of) 58; (curtailment of Medicare programs) 696; (abstracts on work absence) 1019—E; 1133; (Committee reorganization) 1100; (meets with "3rd party" medical chiefs) [Medicine at Work] 1366; (Alabama community medical rating survey) 1378; (conference on perinatal mortality and morbidity programs; health programs for senior citizens) 1554; (indigent medical care in 1958) 2151
Council on Mental Health, medical use of hypnosis, 186
Council on National Defense, (physicians subject to draft call in 1959) 906; (survey of physicians separated from active military service) 1904
Council on Rural Health, expanding challenge, [Medicine at Work] 776
Councils and Committees, listing constituent medical societies by, resolution on, 71
delegate retires, Dr. W. E. Vest, of Huntington, W. Va.; Dr. C. A. Hoffman succeeds him, 292
delegates, new, introduction at San Francisco, 54
Directory: See American Medical Directory
Distinguished Service Award, urge members to submit nominations, 1039
division (special) on long-range planning, resolution, 70
dues, limitations of exemptions for residents, resolution on, 66
election of affiliate members and officers, 63
financial statement reviewed, 56
General Practitioner award, (nominations open) 1154; (award to Dr. L. A. Coffin, photos) 2147—E; 2274
grants-in-aid, annual report, 1060
group practices, list compiled by, [Medicine at Work] 1367
guests, distinguished, at San Francisco meeting, 54
guides for evaluation of management and union health centers, report on, 1111
House of Delegates, (abstract of proceedings of San Francisco Meeting) 53; (members and officers who died) 54; (1957 proceedings mailed) 55; (members) 1025; (Reference Committees) 1026; (meetings at Minneapolis) 1028
immunization guide in industry being prepared by, [Medicine at Work] 1898
Industrial Exhibition, Minneapolis meeting, 1122
Joint Committee on Mental Health in Industry, troubled employee, (Medicine at Work) [Golin] 1371; 1377-E
joint meetings with other national medical associations, resolution on, 68

ERICAN MEDICAL ASSOCIATION—Continued
  JOURNAL, (change of address for mailing) 52; 193; 292; 2147-E; (annual report) 1039; (correction) 1564; (report on special edition on ethics) 1086; (unusual medical questions, new column) 1421; (Editor, Dr. Smith resigns, resolution commending him) 2150
  udicial Council, (ethical interpretations and matters relating to membership, annual report on) 1086; (opinions of) 1555
  gislative system to be evaluated, resolution on, 69
  etter regarding conferences on aging, from Dr. Blasingame to U. S. Senate, 695
  etters to Congress regarding request of optometrists for amendment of Social Security Act, 291
  ediation committee, consider establishment of, resolution on, 67
  embers, affiliate, election of, 63
  embership, (service members, reserve officers in Indian service) 59; (resolution of use of stamp) 71; (annual report on records) 1081; (for V. A. physicians) 1117; (ethical interpretation and matters relating to) 1086; (service members, resolution on) 2150
  inneapolis Clinical Meeting, (program) 1025; (industrial exhibition) 1122; (reports of) 1661-E; 1662; (highlights) 2148; (scenes from) 2274-2276
  otion Picture Library, new films added, 938; 1402; 1695; 1935
  ews, reports on, 58; 1012
  fficers, (election of) 63; (list of) 1027; (reports) 1039
  ast-President at meetings of Board of Trustees, resolution on, 70
  ersonnel, changes in at headquarters, 695
  hiladelphia Clinical Meeting, annual report on, 1073
  olicy on medical care for indigent in 1958, (Council report) 2151
  olicy on veterans' medical care, 1103
  eliminary guide for measuring work absence due to illness and injury, report on, 1112; 1230
  resident, address of, San Francisco meeting, 55
  resident-Elect, address of at San Francisco meeting, 55
  resident's page, monthly message, 416; 1020; 1786; 2273
  rinciples of Medical Ethics: See Ethics, Medical
  roceedings of San Francisco Meeting, 53
  ublications, consultation with interested sections, resolution on, 71
  gistration at Minneapolis, 1028
  organization, study of Heller Report, 61; 1039; 2149
  port of officers, 1039
  solutions on . . . , 56; 64-71; 2149; 2150
  n Francisco Meeting, (abstract of proceedings) 53; (reports on) 896; 1074
  ientific Assembly, (Bylaw changes regarding) 60; 63; 1117 (Sections report of San Francisco meeting) 896; (great "show and tell" sessions) [Medicine at Work] 1363
  ientific Exhibits, (at San Francisco, awards for) 900; (at Minneapolis) 1034
  ientific journals circulation, 1083
  ientific program at Minneapolis meeting, 1030
  cretary, report of, at San Francisco, 55
  ction awards at San Francisco, 901
  ction on General Practice, (Chairman's address) [McArthur] *1740
  ction on Military Medicine, (Chairman's address) [Hays] *254
  ction on Obstetrics and Gynecology wants representation on Joint Commission on Accreditation of Hospitals, resolution on, 898
  ction on Pediatrics, (Chairman's address) [Wheatley] *856; (reply) [DeBacker] 1929-C
  ction on Preventive Medicine, (Chairman's address) [Underwood] *1000
  ction on Urology, (Chairman's address) [Barnes] *750
  ctions of Scientific Assembly, report of San Francisco meeting, 896
  Statement regarding appropriation for military dependents before Senate committee, 1551
  Statement regarding number of hospital beds to be authorized in VA facilities before House committee, 191
  Student A. M. A.: See Students, Medical
  suggested guides for medical society sponsored voluntary prepayment medical benefit plans, annual report on, 1116
  Washington Office, (evaluation, resolution on) 69; (annual report) 1048
  Woman's Auxiliary: See Woman's Auxiliary
AMIDOPYRINE: See Aminopyrine
AMINES
  pressor, in shock of myocardial infarction, (Council report) [Selzer & Rytand] *762
AMINO ACIDS: See also specific acids as Phenylalanine
  plasma, in malignancy, India, 2168
p-AMINO-BENZOLSULFONAMIDO-PHENYLPYRAZOL
  long-acting sulfonamide, clinical experiences with, [Esselier] 1722—ab
Δ-AMINOLEVULIC ACID
  urinary, in different types of porphyria, [Haeger] 2181—ab
4-AMINO-N¹⁰ METHYL PTEROYLGLUTAMIC ACID
  treatment of choriocarcinoma and related trophoblastic tumors in women, [Hertz & others] *815; 891-E
AMINOPHERASE: See Transaminase
AMINOPYRINE
  prednisone with: Pyracortine, India, 2043
  toxic agent in etiology of leukemia, [Scheuer-Karpin] 1265—ab
AMINOSALICYLIC ACID (PAS)
  phenyl ester of (Tebamin), clinical studies, [Tørning] 1281—ab
  treatment, alkali with, 2082
  treatment plus isoniazid and streptomycin in urogenital tuberculosis, [Hansson] 1720—ab
AMMONIA: See also Blood ammonia
  intoxication in cirrhosis after chlorothiazide therapy, [Magid & others] *35
AMNIOTIC FLUID
  maternal death due to pulmonary embolism by, [Carone] 2314—ab
AMPHETAMINE
  athletes and performance, [Medicine at Work] 775; (A. M. A. committee to continue study) 2150
  toxicity: psychosis, United Kingdom, 2016
AMPHOTERICIN B
  treatment of cryptococcal meningitis, [Rubin] 1271—ab
AMPULLA OF VATER
  adenocarcinoma, primary, [Hayden] 218—ab
AMYLOIDOSIS
  of heart, [Mulligan] 348—ab
  primary, of ureter, [Andreas] 466—ab
  relation to collagen disease, [Tellum] 1813—ab
ANALGESIA
  anileridine hydrochloride as, [Therien & others] *2098
  balanced, for poor-risk patient undergoing thoracic surgery, [Santos & Sweet] *1977
  congenital, generalized, [Lamy] 464—ab
  obstetric, pulmonary hyaline membrane contamination by fluid of birth canal in rabbits, [Snyder] 120—ab
  promethazine in obstetrics, [Carroll & Moir] *2218
ANAPHYLAXIS: See Allergy
ANASARCA
  edema, polyserositis and, anomalous case of, [Rowntree & others] *411
ANATOMY
  Gray's Anatomy, centenary celebrated, United Kingdom, 1152
  inadequate supply of anatomical material, 1502
ANCYLOSTOMIASIS
  braziliensis, creeping eruption, [van Zeben] 833—ab
ANDROGENS
  testosterone enanthate, high doses for cancer of cervix, [Rossi] 1584—ab
  testosterone enanthate in palliative treatment of genital cancer, [Giornelli] 1583—ab
  testosterone propionate and castration for breast carcinoma, [Nogués] 713—ab
  treatment of mammary cancer in women, [Vaccato] 950—ab; (sex chromatin in cell nucleus) [Ehlers] 1161—ab
  treatment plus estrogens for degeneration of teeth? 2333
  treatment (topical) in vulvar kraurosis-leukoplakia syndrome, [Richardson] 2312—ab
ANEMIA
  after subtotal gastrectomy, [van Geertruyden] 217—ab
  aplastic, 50 cases, [Mohler] 1264—ab
  aregenerative, with benign thymoma, [Clarkson] 1403—ab
  chronic, simple, treatment, 227
  Cooley's: See Leptocytosis
  erythremic myelosis and familial thalassemia, [Olshin] 1281—ab
  hemolytic and hypochromic, and elevated cold agglutinins in child, (Diagnostic Problems) [Kushner & Szanto] *1013
  hypochromic, ferrous succinate for, India, 1151
  hypochromic, in hiatus hernia confused with angina pectoris, (replies) [Schaus; and original consultant] 228
  in pregnancy, (United Kingdom) 923; (iron-deficiency, prophylaxis) [Kerr] 1939—ab
  Mediterranean: See Leptocytosis
ANEMIA—Continued
  sickle cell, role of spleen and effect of splenectomy in, [Sprague] 224—ab
  splenic pancytopenia, primary; dramatic effect of splenectomy, [Tapie] 2188—ab
ANEMIA, PERNICIOUS
  diagnosis, Schilling test in, [Abels] 442—ab
  diagnostic value of radioactive vitamin B₁₂, [Pitney] 442—ab
  intrinsic-factor-inhibiting substance in serum after oral treatment, [Schwartz] 943—ab
  treatment, intrinsic factor plus vitamin B₁₂, [Croizat] 1580—ab
  treatment, vitamin B₁₂, administration and dosage, 1836
ANESTHESIA
  better, Norway, 923
  complications: cardiac arrest, (R-wave monitor to detect) [Veling] *753; (problem of) [McCarthy] *2101
  cyclopropane, manual and mechanical control of ventilation during, [Wester & others] *2219
  death due to change of, United Kingdom, 1927
  electroencephalography to control depth, [Bakulev] 1164—ab
  emphysematous patient and, [Nunn] 974—ab
  factor in decline of maternal mortality, [Klein & Clahr] *237
  general, anaphylaxis impossible during? 1958
  general, complications of endotracheal intubation, [Hamelberg & others] *1959
  iatrogenic disease and, [Dundee] 974—ab
  intraosseous, in operations on extremities, [Okhotsky] 1825—ab
  light cooling as adjunct in poor risk patients, [Brewer] 1588—ab
  local, absorption, [Campbell & Adriani] *873
  local, is heat sterilization a necessity? [Bridenbaugh & Moore] *1334
  potentiated, new Soviet drugs, [Kazansky] 1824—ab
  problems in cardiopulmonary bypass for open heart surgery, [Keats] 1289—ab
  regional, reappraisal, [Bonica] *734
  single lung, in surgery, [Zhorov] 1417—ab
  spinal, arachnoiditis, and paraplegia, [Joseph & Denson] *1330
  spinal, electromyogram to evaluate neurological complications of, [Marinacci & Courville] *1337
  spinal, from surgeon's standpoint, [Scarborough] *1324
  spinal, pharmacology of compounds used, [Featherstone] *1327
ANEURYSM
  arterial, splenic, [Ward-McQuaid] 824—ab; (ruptured) [James] 825—ab
  congenital, of aortic sinuses, prognosis, [Davidsen] 115—ab
  intracranial arteriovenous, effect on cardiovascular system, [Höök] 335—ab
  of internal carotid artery and its bifurcation, surgery for, [Björkesten] 450—ab
  of middle cerebral artery, [Björkesten] 1712—ab
  traumatic, of thoracic aorta, acute and chronic, roentgen diagnosis, [Steinberg] 973—ab
ANGINA PECTORIS
  assay of antianginal agents: "rapport period," [Cole & others] *275
  hiatus hernia with symptoms similar to, (replies) [Schaus; and original consultant] 228
  internal-mammary-artery ligation fails to relieve, [Fish] 1709—ab
  patient and physician in symptom formation, [Chambers & others] *1617
  treatment: iproniazid, (Switzerland) 1572; [Casellas Bernat] 1946—ab; [Master] 2324—ab
ANGIOMATOSIS
  retinae, 11 years after diathermy coagulation, [Vail] 2322—ab
  treatment: radioactive iodine, [Segal] 346—ab
ANILERIDINE HYDROCHLORIDE
  as analgesic and sedative, [Therien & others] *2098
ANIMALS: See also Dogs; Pigs
  animal care meeting, Chicago, Dec. 3-5, 1662
  animal experimentation, supply of material in medical education, 1503
  animal experimentation, United Kingdom, 926
  rabies in coyote, Mich., 909
ANIMATION, suspended, United Kingdom, 1152
ANISINDIONE
  new anticoagulant, United Kingdom, 1928
ANOMALIES: See Abnormalities; under names of specific organs as Heart
ANOREXIA: See Appetite
ANOXIA: See Oxygen deficiency
ANSOLYSEN: See Pentolinium Tartrate
ANTABUSE: See Disulfiram
ANTHRAX
  bone meal and, United Kingdom, 314
ANTIBACTERIALS: See Antibiotics; Chemotherapy; and under specific drugs

ANTIBIOTICS: See also under specific names as Penicillin
  complications of mastoiditis in antibiotic era, [Morrow] 124—ab
  disks, control in Canada, 1677; [Greenberg] 1726—ab
  factory, health hazards in, Denmark, 208
  incidence of morbidity and disorders secondary to serofibrinous pleurisy in pulmonary tuberculosis before and after era of, [Batini] 2317—ab
  new, iturine, Belgium, 2290
  new, misuse of kanamycin, [Mann] 814—C
  prolonged corticosteroid therapy with, 134
  resistant staphylococcal outbreaks in medical and surgical ward, [Barber] 945—ab
  resistant staphylococcic infections, familial, caused by exposure of babies in hospital nurseries, [Hurst] 1826—ab
  sensitivity tests of Escherichia coli strains isolated in 1957, [Tóth] 122—ab
  staphylococcic enteritis and, Sweden, 1395
  toxicity, gastrointestinal, [McHardy] *1868
  toxicity, hazards, (United Kingdom) 928; [Herrell] *1875
  treatment of acute tonsillitis and otitis media, United Kingdom, 2049
  treatment of bartonellemia in man, [Larrea R.] 1946—ab
  treatment of protracted septic endocarditis, [Chikina] 939—ab
  yeast, with therapeutic and prophylactic properties, [Parfentjev] 1724—ab
ANTIBODIES
  Poliomyelitis: See also under Poliomyelitis
  poliovirus, in pregnancy, transfer, persistence and induction in infants, [Martins da Silva & others] *1
  rubella neutralizing, in gamma globulin, [Krugman] 1281—ab
  tuberculosis, in patients with Boeck's sarcoid, [Müller] 1288—ab
ANTICHOLINESTERASE
  intoxication, control of, [Cann & others] *717
ANTICOAGULANTS: See also under specific anticoagulants, as Acenocoumarol
  effects on occurrence of cardiac rupture and hemopericardium after heart infarction, [Aarseth; Lange] 1415—ab
  new, United Kingdom, 1928
  to prevent cerebral thrombosis after one attack in man 65? 1593
  toxicity, effects of concurrent use of antihistamines and aspirin, 1168
  treatment, (Norway) 309; (long-term, United Kingdom) 924; [Owren] 1163—ab
  treatment of acute myocardial infarction, [Richards] 439—ab
  treatment of acute venous thromboembolism, [Anlyan & others] *725
  treatment, oral surgery during, 2081
ANTICONVULSANTS: See Convulsions
ANTIDIURESIS: See Diuresis
ANTIGENS
  treponemic, France, 1255
ANTIHISTAMINES: See also specific antihistamines
  effects on efficiency of anticoagulants, 1168
ANUS
  imperforate, failure of migration of rectal opening as cause of, [Bill] 116—ab
  tumors, lymphoid polyps, [Holtz] 115—ab
ANXIETY
  patient and physician in cardiac symptom formation, [Chambers & others] *1617
AORTA
  abdominal, occlusion, [Chiappa] 972—ab; (surgical considerations) [De Bakey] 2188—ab
  Aneurysm: See Aneurysm
  catheterization, coronary arteriography in ischemic heart disease, [Thal & others] *2104
  catheterization, percutaneous left ventricular puncture with, [Fleming] 447—ab
  coarctation repair with relief of hypertension in man 57, [Kittle & others] *2006
  disease, acquired, surgical treatment, [Gwathmey] 1268—ab
  grafts, failure and replacement of, [Gaspar] 1267—ab
  idiopathic retroperitoneal fibrosis involving, [Hackett] 1707—ab
  injury, nonpenetrating traumatic, [Parmley] 113—ab
  isthmus stenosis, surgical treatment, [Kremer] 1706—ab
  roentgen study in determination of operability in arteriosclerosis of lower extremities, [Wylie] 2077—ab
  roentgen study, technic, France, 1254
AORTIC VALVE
  endocarditis, and brucellosis, [Peery] 1810—ab
  stenosis, congenital, valvotomy during cardiopulmonary bypass for, [Spencer] 822—ab
  stenosis, practical management, [Glover & Gadboys] *229
  stenosis, segmentary, Brazil, 802
  surgery, direct coronary artery perfusion, [Kay & others] *1767
APHTHOSIS: See Mucous Membranes
APOPLEXY: See Brain hemorrhage
APPARATUS: See also Equipment; Instruments; and specific apparatus
  [illegible] by physicians, (Ju- [illegible] on) 1556
[illegible]
  falling death rate from, Norway, 922
  in childhood, 1,358 cases, [Longino] 1279—ab
  incidence high in Bombay State, [Patel] 1725—ab
  peritonitis from, treatment with and without *Terramycin, [Adwan] 332—ab*
APPETITE
  anorexia nervosa: *somatic disorder*, [Williams] 1271—ab
APPLIANCE: See Apparatus; Braces
APRESOLINE: See Hydralazine
ARACHNODACTYLY (Marfan's Syndrome)
  [Erichsen] 2183—ab
  cardiovascular disease in, [van Buchem] 1698—ab
  heredity, importance of autopsies, [Marks & Gerson] *1450
ARACHNOIDITIS
  paraplegia, and spinal anesthesia, [Joseph & Denson] *1330
ARALEN: See Chloroquine
ARGENTAFFINOMA: See Carcinoid
ARISTOCORT: See Triamcinolone
ARM: See also Extremities
  chronic lymphedema, treatment, 1834
ARMAZIDE: See Isoniazid
ARMED FORCES
  A. M. A. membership, resolution on, 2150
  Colonel Benford, *named* director of medical publications, 1247
  commissioning of optometrists, A. M. A. report on, 1068
  Dependents, Medical Care for: See Medicare
  survey of discharged medical personnel, A. M. A. *report on*, 1069
ARMY, UNITED STATES
  Brig. Gen. Prentiss retires, 1247
  early commissioning of medical students, 1536
  medical research and development command established, 1247
  reduces size and frequency of booster shots, 82
  reserve hospital, new headquarters, N. Y., 1382
ARRHYTHMIA: See also Atrial Fibrillation; Tachycardia; Ventricular Fibrillation
  antiarrhythmic drugs in shock of myocardial infarction, (Council report) [Selzer & Rytand] *762
  as [illegible] myocardial infarc- [illegible] and intravenous [illegible] & others] *2124
  control during cyclopropane anesthesia, manual and mechanical control of ventilation, [Wester & others] *2249
  in experimental syncope, [Dermksian & Lamb] *1623
  induced by common respiratory maneuvers, syncope with [Dermksian & Lamb] *1200
  mephentermine and, [Wilson] 1944—ab
ARSENIC
  arsine poisoning from cleaning sulfuric acid tanks, United Kingdom, 311
ARTERENOL (norepinephrine)
  gangrene of extremities following cardiac infarction and, [Greenbaum] 125—ab
ARTERIES
  Aneurysm: See Aneurysm
  basilar insufficiency, roentgen diagnosis and surgical treatment, [Crawford & others] *509
  Coronary. See also Angina Pectoris; Arteriosclerosis; Thrombosis
  coronary, angiocardiography in Bland-White-Garland syndrome, [Lang] 2076—ab
  coronary, anomalous left, surgery using poudrage technic for, [Paul] 112—ab
  coronary arteriography in ischemic heart disease, [Thal & others] *2104
  coronary arteriovenous fistulae, congenital, surgery for, [Fell] 1705—ab
  coronary circulation, anastomosis in, United Kingdom, 2173
  coronary, direct perfusion for aortic valve surgery, [Kay & others] *1767
  coronary disease, consensus about atherogenic index, 360
  coronary disease, 867 patients, India, 1255
  coronary disease, etiology, Indian point of view, [Malhotral] 1575—ab
  coronary disease, hypercholesterolemia and its treatment, [Oliver] 439—ab
  coronary disease in rural communities, United Kingdom, 315
  coronary disease, new concepts, results after surgery, [Beck & others] *2110
  coronary insufficiency after oral gallbladder dye, [Littman] 352—ab
  coronary, left, anomalous origin of; physiologic defect and surgical treatment, [Case] 326—ab
  coronary occlusion, experimental ligation of internal mammary artery for, [Sabiston] 329—ab
ARTERIES—Continued
  coronary occlusion, myocardial consequence in coronary atherosclerosis, [Himbert] 43 —ab
  grafts, peripheral, of crimped nylon and Teflon, [Edwards] 432—ab
  homografts, clinical comparison with braide nylon, [Hohf] 2305—ab
  iliac and femoral, occlusion, surgical considerations, [De Bakey] 2188—ab
  mammary (internal), [illegible] parisons of ligation [illegible] *Davide Fieschi tech* [illegible] 2304—ab
  Mammary (internal) ligation: See also Angina Pectoris; Arteries, coronary; Myocardium
  mesenteric, superior, occlusion of duodenum by compression of, [Bitner] 129—ab
  peripheral insufficiency, endarterectomy for, Norway, 1152
  pulmonary, angiocardiography in Bland-White-Garland syndrome, [Lang] 2076—ab
  pulmonary pressure, frequency of postprimary pulmonary tuberculosis according to, [Mattson] 2298—ab
  renal, nephrogenic hypertension following operative trauma to, [McDonald] 451—ab
  surgery, clinical use of elastic Dacron prosthesis, [Szilagyi] 2305—ab
  ve[illegible]
  vertebral, injury in whiplash injuries, [Seletz] *1750
ARTERIOSCLEROSIS
  arterial hypertension of atherosclerosis, [Lian] 323—ab
  atherogenesis and cholesterolemia, effects dietary protein and carbohydrate in cockere on high-fat, high-cholesterol mash, [Stamler] 976—ab
  atherogenesis and plasma lipids in cholesterol fed cockerels, effects of dietary protein methionine and vitamins on, [Stamler] 97 —ab
  atherogenic index, consensus regarding, 360
  atherosclerosis and serum mucoproteins in Aus tralian aborigine, [Schwartz] 1585—ab
  atherosclerosis in Rhesus monkeys, hypercho lesteremia induced by dietary fat and cho lesterol, [Cox] 969—ab
  cardio-aortic atherosclerosis in presenile an senile patients, [Rosselli] 970—ab
  cerebral, angiographic evaluation of, [Tatelman] 352—ab
  comparative studies of atherosclerosis in Cost Rica, Guatemala and New Orleans, [Tejada 945—ab
  coronary atherosclerosis, coronary occlusio and myocardial consequences in, [Himbert 439—ab
  effect of atherosclerosis upon serum mucopro tein and hexosamine, [Schwartz] 975—ab
  etiology: calcium in, 1297
  experimental atherosclerosis, Canada, 2290
  heart anomalies with pulmonary hypertensio pulmonary embolism, myocardial infarctio and, (Diagnostic Problems) [Kushner Szanto] *277
  nylon bifurcation grafts in, [Hill] 2309—ab
  obliterative, thrombendarterectomy for, No way, 923
  of lower extremities, aortography to dete [illegible] 2077—ab
  [illegible] gastric mucin [illegible] subjects, [Ross [illegible] 1699—ab
  reduce incidence and severity of atheroscl rosis, lower blood lipids by changing foo patterns, [Brown & Page] *1989
ARTERITIS
  186 cases, France, 803
ARTHRITIS
  award exhibit symposium, 903
  fellowships, awards open, 79
  Gairdner Foundation international awards 2281
  of spine, treatment, 843
  [illegible] rheumatoid arthr [illegible] 819—ab
ARTHRITIS, RHEUMATOID
  complications: laryngeal stridor, [Dark 123—ab
  complications: suppurative arthritis, [Kel gren] 109—ab
  diagnosis, slide latex fixation test, [Singer Plotz] *180
  equally common in both sexes, United Kin dom, 312
  of cervical spine in adult, [Sharp] 2303—al
  100 cases, India, 804
  treatment: antimalarial drugs, Denmark, 2
  treatment: chloroquine, [Erlendsson] 964—a
  treatment: intra-articular hydrocortison United Kingdom, 1927
  treatment (long-term), mepacrine and chloro quine, [Erlendsson] 964—ab

ARTHRITIS, RHEUMATOID—Continued
  treatment: prednisone, metabolic and clinical effect, [Ward] 836—ab
  treatment, side-effects from methylprednisolone, [McMahon & Gordon] *1208
  treatment: triamcinolone, United Kingdom, 1258
ARTHRODESIS
  compression in, compare methods of fusion of knee, [Stewart] 328—ab
  extra-articular, of subtalar joint (Grice procedure) in cerebral palsy, [Baker & Dodelin] *1665
ARTHROPLASTY
  use of skin in, Finland, 308
ARTHROSIS: See Knee
ARYL SULFONYLUREAS: See Sulfonylureas
ASCARIASIS
  surgical, in children, [Fernando] 1407—ab
ASCITES: See also Liver cirrhosis
  antidiuretic factor and, India, 1150
  laparoscopy in ascitic syndromes presenting diagnostic difficulties, [Girard] 2189—ab
ASCORBIC ACID
  hypervitaminosis C and osteomyelitis in children, [della Casa] 1819—ab
  natural vs. synthetic form, 2082
  treatment of progressive pigmentary dermatosis, (replies) [Benedek; and original consultant] 1591
ASPHYXIA
  preventing, care of patient with multiple injuries, [Aufranc] *2091
ASPIRATION
  of food and vomitus, United Kingdom, 1152
ASPIRIN: See Acetylsalicylic Acid
ASSOCIATION: See also American Medical Association; Societies, Medical; list of Societies at end of letter S
  of American Medical Colleges, (annual report on A. M. A. cooperation with) 1088; 1089; (medical schools and practice liaison) 1232; (annual teaching institute) 1168; (A. M. A. collaboration with) 1471
  of Teachers of Preventive Medicine, review book on medical care by, (Bureau article) [Bornet] *2025
ASTEROID BODIES
  hyalitis, incidence of diabetes and hypercholesteremia in, [Smith] *891
ASTEROL: See Diamthazole Dihydrochloride
ASTHMA
  attack, wheal at tuberculin P. P. D. test site with, 1424
  dog dander and, (replies) [Howard; and original consultant] 1170
  follow-up on fate of children, [Ryssing] 1942—ab
  in children, Denmark, 919
  in children, pulmonary atelectasis in, [Luhr] 2194—ab
  physical conditioning program for children, [Scherr & Frankel] *1996
  pulmonary sensory endings hyperexcitable in: measurement, characteristics, causes, and role as reflex factor, [Tiffeneau] 1588—ab
  sedimentation rate affected by? 2334
  treatment, ACTH action in, 1836
  treatment, hazards in, [Sherman] *1866
  treatment, hydrocortisone inhalation, [Herxheimer] 2196—ab; [Helm] 2197—ab
  treatment, hydrocortisone, United Kingdom, 1928
  treatment, inhalation of negative air-borne ions proposed for, 1059
  treatment, methylprednisolone, side-effects in, [McMahon & Gordon] *1208
ASYSTOLE: See Arrhythmia
ATABRINE: See Quinacrine
ATAXIA
  cerebellar, acute, of undetermined origin in childhood, [Walcher] 1941—ab
  hereditary, Refsum's syndrome, United Kingdom, 927
  spinal form of hereditary sclerosis, ACTH or corticosteroids for? 1957
ATELECTASIS: See Lungs, collapse
ATHEROMA
  near origin of vertebral artery, roentgen diagnosis and surgical treatment of basilar artery insufficiency, [Crawford & others] *509
ATHEROSCLEROSIS: See Arteriosclerosis
ATHETOSIS
  congenital, not helped by chemopallidectomy, [Paxton & Dow] *755
ATHLETICS: See also under specific sport, as *Boxing*
  amphetamines, athletes, and performance, [Medicine at Work] 775; (A. M. A. committee to continue study) 2150
  for children, competitive, [Hoxie] *1439
  for children, desirable, [Maksim] *1431
  for children, educational aspects, [Hein] *1434
  implications of longitudinal research in fitness programs, [McCammon & Sexton] *1440
  injuries, conference on, Wis., 77
  pyodermia in runners, Sweden, 211
ATHLETICS—Continued
  safety in sports, a milestone and a program, [Medicine at Work] 774
ATLAS
  dislocation on axis, value of early fusion of C-1, C-2, and C-3, [Alexander] 453—ab
ATOMIC ENERGY: See also Radioactive
  acute clinical effects of penetrating nuclear radiation, [Gerstner] *381
  Commission to lease or sell heavy water, 301
  demonstration program in high schools, 797
  flash; flash blindness and chorioretinal burns produced by, (guest editorial) [Byrnes] 778—E
  Hydrogen Bomb: See Hydrogen Bomb
  medical maneuvers after mock nuclear explosion, United Kingdom, 2172
  medicine, A. M. A. *ad hoc* Committee on, 56; 1059; [Medicine at Work] 1370
  medicine, program of Navy, 1541
  nuclear nursing, establish Navy course in, 914
  peaceful uses, WHO report, 929
  penetrating, acute clinical effects of, [Gerstner] *381
  stomach carcinoma in Hiroshima, [Murphy] 469—ab
  warfare, use of medical x-ray film in, [Nitka] 130—ab
ATOSIL: See Promethazine
ATRIAL FIBRILLATION
  paroxysmal, affected by carotid sinus stimulation? 1169
ATROPINE
  treatment of arrhythmia due to respiratory maneuver, [Dermksian & Lamb] *1623
ATTORNEYS
  opinions of 10,000 sought in medicolegal study, [Medicine at Work] 1899
  physicians and, interprofessional code for, 1661—E; [Medicine and the Law] 1663
AUSCULTATION
  important aid to diagnosis of fractures, [Colwill] 116—ab
AUTOMOBILES
  accidents, (Denmark) 707; (United Kingdom) 808
  accidents, causes vs. symptoms, [Blossom] *2221
  accidents, deaths decrease, 2280
  accidents, education in prevention of, [Neyhart] *2209
  accidents, importance of cough syncopy to, Denmark, 1924
  accidents, ruptured diaphragm in, [Bernatz & others] *877
  accidents, 22,880 deaths in 8 months, 6% below last year, 1244
  accidents, whiplash injuries, [Seletz] *1750
  Allstate Safety Crusade Certificate of Commendation for leadership in safety, Va., 76
  drivers, breath tests, legal validity, Canada, 2290
  drivers' license, medical opinion on, Canada, 431
  driving and alcohol, United Kingdom, 2175
  mobile units in employee health programs, [Medicine at Work] 1898
  motoring, [Leisure Corner] 103
  parking, and patients, Canada, 1679
  request old pictures of, Ill., 1909
  safety, objectives for state medical society traffic safety committees, [Rodger] *2215
AUTOPSIES
  hospitals having the highest rates, 524
  importance of, illustrative case, [Marks & Gerson] *1450
  tissue diagnosis in, transforaminal curet necropsy of brain, [MacHaffie] 1823—ab
AVIATION
  acute respiratory disease in Royal Air Force, 1683
  flying personnel, cardiac arrhythmias in experimental syncope, [Dermksian & Lamb] *1623
  International Symposium on Physics and Medicine of Atmosphere and Space, 797; [Medicine at Work] 1369
  licensing of pilots with diabetes, 363
  medical considerations of exposure to microwaves, [Barron & Baraff] *1194
  medical problems of space flight, symposium on, Texas, 1383
  medicine, A. M. A. Committee on, annual report, 1065
  medicine, Board action on C. A. A., 55
  medicine, graduate training for naval officers, 1540
  medicine in private practice, [Vastine] *1185
  medicine, school of, authorize new research laboratories at Brooks Air Force Base, 82
  military symposium on space medicine, 301
  national space program, annual report on, 1071
  research on human factors of aerial warfare, Stapp] *1744
  syncope in healthy flying personnel, incidence, mechanisms, and significance, [Dermksian & Lamb] *1200
  10 years of space medicine, 2024—E
AVIATION—Continued
  20-year study of physiological measurements in senior airline pilots, [Kidera] *1188
AVIATION, U. S. AIR FORCE
  consultants and command surgeons conference, 914
  consultants visit installations overseas, 2035
  Flight Test Center, role of Human Factors Branch at, [Rowen] *1190
  Maj. Gen. Armstrong retires, 1247
  medical symposium in Japan, 425
  new hospitals, (photos) (Illinois) 301; (Andrews Air Force Base) 2035
  program for medical students, 1541
AXILLA
  excessive perspiration, treatment, (replies) [Berberian; and original consultant] 363
AXIS
  dislocation of atlas on, value of early fusion of C-1, C-2, and C-3, [Alexander] 453—ab
AZURE A RESIN
  in tubeless gastric analysis, [Rosenthal & Buscaglia] *409

B

BACITRACIN
  treatment of amebiasis, India, 1926
BACK
  problem back, [Kirkpatrick] *1864
BACTERIA
  bacterial lipopolysaccharides for inflammation of adnexa, [Fricke] 1273—ab
  mycobacterial etiology of multiple sclerosis, [Bauer] 1410—ab
BACTERIOPHAGE
  treatment of staphylococcic infections, 1423
BAGASSE; BAGASSOSIS: See *Pneumonoconiosis*
BALDNESS: See Alopecia
BANDAGE: See Dressings
"BANGUNGUT syndrome" clinical reconstruction, [Nolasco] 1403—ab
BARBERS
  sterilization of tools, 362
BARBITURATES
  toxicity: accidental poisoning, control of, [Cann & others] *717
  toxicity: acute poisoning, treatment, 10 years' experience, [Louw] 457—ab
  treatment of tetanus, [Miller & Stoelting] *393
BARTONELLOSIS
  bartonellemia in man, antibiotics in, [Larrea R.] 1946—ab
BASIC SCIENCES
  applied, instruction, annual report on, 1100
  functions and structure of modern school of, approved and recommended for adoption, 1089; 1096; 1470
  graduate education in, 1495; 1496
BAUER, W. W., Howe Honor Award presented to by American School Health Association, 1663
BEADLE, GEORGE WELLS, Nobel prize to, 2159
BEADOX: See Pyridoxine
BEHAVIOR
  changes in intoxication, (Committee report) [Bogen] 48
BEHCET SYNDROME
  or Touraine's aphthosis, [Thibault] 913—ab
BELCHING: See Eructation
BEMEGRIDE
  treatment of barbiturate poisoning, (Cann & others] *717
BENADON: See Pyridoxine
[illegible] See [illegible]is, asteroid
  [illegible] reptococcal in- [illegible] [McFarland] 714—ab
  toxicity, reactions to, [McFarland] 965—ab
BENZAZOLINE: See Tolazoline
BENZEDRINE: See Amphetamine
BENZOCAINE: See Ethyl Aminobenzoate
BENZPYRENE
  research on smoking and cancer, United Kingdom, 212
[illegible] See Tolazoline
[illegible] Alcoholism
BICILLIN: See Benzathine Penicillin G
BIERMER'S DISEASE: See Anemia, Pernicious
BILE
  acid secretion and serum-cholesterol, *effect of dietary oils on, [Lewis] 131—ab*
  copper and iron before and after intravenous copper and iron in chronic liver disease, [Bertolini] 840—ab
BILE DUCTS
  common, cystic dilatation, congenital, especially radiographic studies, [Kavitch] 2310—ab
  common, lesions, Sweden, 708
  common, movements, image intensifier to study, [Burnett] 1950—ab
  common, repair injury to, [Hoffman] 1268—ab
  cystic, congenital absence of, [Pines] 953—ab
  roentgen study, intravenous, [Goldenberg] 1587—ab

BILIARY TRACT
  cancer, Brazil, 1391
  cancer, diagnosis, (exfoliative cytology, rapid method of duodenal intubation) [Raskin] 440—ab; (secretin test) [Wenger] 441—ab
  colic, diazotization rate of blood bilirubin in diagnosis, [Schalm] 2061—ab
  disease, duodenal ulcer caused by? 2080
  endoscopy, Germany, 1679
  obstruction in newborn, serum transaminase activity in, [Kove & others] *860
  roentgen study, status of nonoperative cholecystoangiography, [Cohn] 353—ab
BILIRUBIN in Blood: See Blood bilirubin
BIOFLAVONOIDS
  in treatment of bleeding duodenal ulcer, [Weiss] 216—ab
BIOGRAPHY
  Carl von Linné's autobiographies, Sweden, 1800
BIOPSIES: See under specific organ, as Liver
BIRTH: See Infants, Newborn; Labor
  Multiple: See Pregnancy, multiple; Twins
  Premature: See Infants, premature; Labor
  Rate: See Vital Statistics
BIRTH CONTROL: See Contraception
BISHYDROXYCOUMARIN
  effects on serum uric acid, [Hansen] 1576—ab
BITES: See Insects; Snakebite
BLADDER
  cancer, subtotal cystectomy and total bladder regeneration in, [Baker & others] *1178
  cancer, treatment, [Anderson] 2319—ab
  exstrophied, new therapeutic concept, [Snyder] 1269—ab
  Hunner's ulcer, [Kinder] 2320—ab
  inflammation, radiation cystitis, [Pool] *854
  obstruction of neck, diagnosis, treatment, postoperative care, [Ray & Cervantes] *395
  rupture, management of severely injured patient, [Schulte] *2094
  tumors, tantalum 182 for, [Jönsson] 961—ab
  vesical mucosa after radium for cervical carcinoma, pseudoneoplastic changes, [Natale] 349—ab
  vesicoureteral reflux in children, [Jones] 1579—ab; (significance) [Politano] 1821—ab
BLAND-WHITE-GARLAND syndrome, angiocardiographic features of, [Lang] 2076—ab
BLINDNESS
  flash, produced by atomic flash, (guest editorial) [Byrnes] 778—E
BLINKING in child, cause, therapy, 137
BLISH, M. ELEANOR, appointed to field staff of Council on Medical Education and Hospitals, 695
BLOCH-SULZBERGER'S DISEASE: See Melanin, pigmentation
BLOOD
  absorption of local anesthetics, [Campbell & Adriani] *873
  Agammaglobulinemia: See Gamma Globulin
  alcohol, interpret tests for intoxication, (Committee report) [Turner & others] *1359
  amino acids in [illegible]
  Aminopherase: [illegible]
  ammonia in liver [illegible]
  ammonia intoxication in cirrhosis after chlorothiazide therapy, [Magid & others] *35
  antibacterial activity after oral triacetyloleandomycin, erthromycin, potassium penicillin V, and penicillin V, [Kunin] 2071—ab
  Bank: See Blood Transfusion
  bartonellemia, antibiotics in, [Larrea R.] 1946—ab
  bilirubin, diazotization rate in diagnosis of biliary colic, [Schalm] 2061—ab
  bilirubin low in kernicterus in premature infants, [Harris] 461—ab
  carbon dioxide combining power, test for, 2328
  Cells: See Erythrocytes; Leukocytes
  changes in multiple myeloma, [Prato] 215—ab; 216—ab
  chlorides, hyperchloremic acidosis in chronic pyelonephritis, [Lathem] 215—ab
  cholesterol, and bile-acid secretion, effect of dietary oils on, [Lewis] 131—ab
  cholesterol and infertility, 980
  cholesterol and nutrition, [Picchio] 131—ab
  cholesterol and people living in urban and rural districts, Finland, 307
  cholesterol changes in hypertension during therapy, [Deming] 322—ab
  cholesterol during pregnancy, (reply) [Wetstone] 844
  cholesterol, effects of dietary protein and carbohydrate on experimental cholesterolemia and atherogenesis, [Stamler] 976—ab
  cholesterol elevated after myocardial infarction, cause, treatment, 844
  cholesterol elevated, cheese cause? 1294
  cholesterol-globulin complex in multiple myeloma, [Schless] 128—ab
  cholesterol, hypercholesteremia incidence in asteroid hyalitis, [Smith] *891
  cholesterol, hypercholesteremia induced by cholesterol and dietary fat, in monkey, [Cox] 969—ab
  cholesterol, hypercholesteremia, nicotinic acid in, N. N. D., 1773

BLOOD—Continued
  cholesterol, hypercholesterolemia and coronary disease, treatment, [Oliver] 439—ab
  cholesterol, hypocholesterolergic drug, France, 209
  cholesterol, lower by changing food patterns, [Brown & Page] *1989
  cholesterol, variability and difficulty of evaluating decholesterolizing agents, as "sitosterols," [Levere] 711—ab
  cholinesterase and myasthenia gravis after exposure to insecticides, (replies) [Trimble; and original consultant] 138
  Coagulation, Anticoagulants: See Anticoagulants
  coagulation, evidence linking atherosclerosis with, Canada, 2291
  coagulation factors, Israel, 2044
  coagulation, fat intake, and physical activity, United Kingdom, 1682
  coagulation, prevention, units of heparin required, 167:1806; Aug. 2, 1958; (correction) 168:1670, Nov. 22, 1958
  cold agglutinins elevated, and hemolytic and hypochromic anemia in child, (Diagnostic Problems) [Kushner & Szanto] *1013
  complications during ristocetin therapy, [Gangarosa] 1582—ab
  cyanocobalamin, significance in liver disease, [Rachmilewitz] 106—ab
  diagnostic aids in myocardial infarction, [Durant] 322—ab
  Donors: See Blood Transfusion
  Dyscrasia: See also specific dyscrasias as Granulocytopenia
  dyscrasias, A. M. A. Subcommittee annual report, 1060
  factors in syncope in healthy young adults, [Dermksian & Lamb] *1200
  Fats: See Blood lipids
  fetal, loss with placenta previa, 1168
  fibrin, hyperfibrinemia in malignancy, France, 1797
  fibrinogen, congenital afibrinogenemia, [van Creveld] 1819—ab
  fibrinogen, hypofibrinogenemia, cause, relation to uterus abnormalities, prognosis of pregnancy, 2085
  Globulin: See Gamma Globulin; Globulin; Poliomyelitis Immune Globulin
  Glucose: See Blood sugar
  Groups: See also Rh Factor
  groups, ABO incompatibility and hemolytic disease of newborn, [Valentine] 460—ab
  groups A and B change? 1833
  groups, hazards of parental blood for measles modification, (replies) [Berryhill; and original consultant] 1170
  groups in Cyprus, United Kingdom, 2172
  groups in Sephardic Jews, Israel, 94
  hematology research grants open, 794
  Hypogammaglobulinemia: See Gamma Globulin
  "in vitro" survival of Toxoplasma gondii in, [Talice] 350—ab
  insulin estimation, India, 2168
  intrinsic-factor-inhibiting substance in, after oral treatment in pernicious anemia, [Schwartz] 943—ab
  isoniazid, early results of isoniazid therapy in relation to, [Vivien] 325—ab
  lipids and diet, the physician himself, [McArthur] *1740
  lipids, effects of dietary proteins, methionine and vitamins on, in cholesterol-fed cockerels, [Stamler] 976—ab
  lipids, idiopathic hyperlipemia, [Nazzaro] 325—ab
  lipids, lower by changing food patterns, [Brown & Page] *1989
  menstrual, examine for tubercle bacilli in tuberculosis sanatorium, [Pickroth] 2070—ab
  mucoproteins and atherosclerosis of Australian aborigine, [Schwartz] 1585—ab
  mucoproteins and hexosamine, effect of atherosclerosis and age upon, [Schwartz] 975—ab
  mucoproteins in prostatic carcinoma, [Arcadi] 1943—ab
  oxytocinase inactivates oxytocin, Austria, 2040
  peripheral, failure to prove identity of tumor cells in, [Taylor] 2198—ab
  phospholipids, genetic and environmental influences, [Schaefer] 1950—ab
  plasma-clearing effect of gastric mucin in healthy and atherosclerotic subjects, [Rossi] 1699—ab
  platelets, thrombopathies with congenital cardiopathies, [Alagille] 326—ab
  platelets, thrombopathy and moderate hemophilia, simultaneous in one family, [van Creveld] 1812—ab
  platelets, thromboplastin, prothrombin and fibrinogen; hemorrhage and massive transfusion, [Ulin & others] *1971
  Poliomyelitis Antibodies in: See Poliomyelitis
  potassium, hypokalemia in cascara poisoning, United Kingdom, 316
  potassium, primary renal hypokalemia-primary aldosteronism, [Alsted] 1578—ab

BLOOD—Continued
  precipitation test and systemic lupus erythematosus, (reply) [Dubois & others] 813—C
  Protein: See also Gamma Globulin; Globulin; Poliomyelitis Immune Globulin
  protein changes in chronic filariasis, India, 1798
  proteins and nutrition, India, 92
  proteins in gastroduodenal ulcer, [Dupuy] 1406—ab
  proteins in hepatic cirrhosis, India, 1151
  proteins in leishmaniasis, India, 433
  proteins in ulcer, influence of protein therapy on, [Dupuy] 1406—ab
  proteins, regeneration of, India, 920
  prothrombin, therapeutic hypoprothrobinemia during acenocoumarol therapy, [Rullo & others] *743
  rupture of normal spleen during delivery, hematologic investigations during convalescence, [Hottinger] 461—ab
  sedimentation of leukocytes in lymphosarcoma, reticulosarcoma and malignant lymphogranuloma, [Bellesia] 2075—ab
  sedimention rate, asthma affect? 2334
  sodium, hypernatremia in atypical heat stroke, [Baxter] 109—ab
  studies, metabolic and biochemical changes in normal pregnancy, (Council article) [Macy] *2265
  studies, Vanderbilt cooperative study of maternal and infant nutrition, (Council article) [McGanity & others] *2138
  sugar, clinical trials with DBI, oral hypoglycemic agent, [Krall] 835—ab
  sugar, effect of soluseptasine on, India, 1257
  sugar, hypoglycemia, symptoms, treatment, 2330
  sugar, hypoglycemic agent: chloropropamide, [Murray] 2074—ab
  sugar, hypoglycemic sulfonamides, France, 803
  sugar, *random* glucose levels, evaluation in ambulant women, [Macy & others] *2010
  Tests: See also Syphilis, serodiagnosis
  tests, analysis of presenile and senile patients with cardio-aortic atherosclerosis, [Rosselli] 970—ab
  tests, examination with oxalated blood, 1593
  tests, premarital, compulsory, results of epidemiologic study, 289—E
  tests, slide latex fixation in diagnosis of rheumatoid arthritis, [Singer & Plotz] *180
  thyroid-stimulating hormone in, New Zealand, 1926
  Transaminase: See Transaminase
  Types: See Blood groups
  uric acid, chlorothiazide as hyperuricacidemic agent, [Oren & others] *2128
  uric acid, effects of Dicumarol on, [Hansen] 1576—ab
  viremia in mumps virus infection, [Overman] 2061—ab
  virus in Coxsackie B virus infection [Utz & Shelokov] *264
  volume after plasma and blood transfusions, [Wollheim] 1700—ab
BLOOD PRESSURE
  brachial and digital, Canada, 1678
  fall accompanying reduction in obesity, role of salt in, [Dahl] 322—ab
  low, hypotensive sedative from Vinca rosea, India, 1799
  Portal: See Portal Vein
  pulmonary, frequency of postprimary pulmonary tuberculosis according to, [Mattson] 2298—ab
BLOOD PRESSURE, HIGH
  arterial, of atherosclerosis, [Lian] 323—ab
  coarctation repair relieves, in man 57, [Kittle & others] *2006
  complications, cardiac, [Cornish] 1697—ab
  consequence of increased arterial pressure, study rats with hydralazine-treated renal hypertension, [Masson] 2076—ab
  degenerative, in the Orient, [Schroeder] 1697—ab
  essential, role of dietary sodium in, [Dahl] 323—ab
  histology of kidney biopsy specimens in, [Sommers] 970—ab
  intrarenal arteriovenous fistula with, literature review, [Milloy] 823—ab
  juvenile, with renal disease, nephrectomy in, [Welch] 463—ab
  low-sodium diets in, (Council report) [Danowski] *1886
  malignant, effectiveness of long-term therapy, [Dustan] 2299—ab
  nephrogenic, after operative trauma to renal artery, [McDonald] 451—ab
  Portal Hypertension: See Portal Vein
  pulmonary, in heart anomalies with arteriosclerosis, pulmonary embolism and myocardial infarction, (Diagnostic Problems) [Kushner & Szanto] *277
  severe, medical and surgical treatment, effects on mortality compared, [Perry] 2300—ab
  severe, renal function in patients recuperated from, [Caeiro] 819—ab

- BLOOD PRESSURE, HIGH—Continued
  - treatment, 4 year evaluation of agent, [Roberts] 1916—ab
  - treatment: long-acting oral ganglion blocking agent, [Locket] 1582—ab
  - treatment: mecamylamine, (India) 209; [Lucchelli] 834—ab
  - treatment: Pempidine, United Kingdom, 318; [Harington] 1416—ab
  - treatment, potentiate therapy by use of chlorothiazide, [Rochelle & others] *110
  - treatment, serum cholesterol changes during, [Deming] 322—ab
- BLOOD TRANSFUSION
  - biological activity of bank blood, 135
  - biomechanical equipment for long-term preservation of erythrocytes, [Ketchel & others] *104
  - blood and plasma, blood volume after, [Wollheim] 1700—ab
  - can Rh factor change without previous pregnancy or? 1833
  - complications: citrate intoxication, (United Kingdom) 926; [Ludbrook] 1709—ab
  - complications from contaminated blood, recognition and treatment, [Braude] 836—ab
  - complications: hemosiderosis, radiologic signs in, [Shanbrom & Zheutlin] *83
  - complications: hepatitis, Norway, 922
  - diagnosis and management of gastrointestinal hemorrhage, [Maloney] *1601
  - exchange, in control of accidental poisoning, [Cann & others] *717; (in children) [Bruton] 1820—ab
  - exchange, unexplained death from, [Taylor] 340—ab
  - first use of, 1834
  - forcible blood injection into arterial system in terminal states, [Radushkevich] 1711—ab
  - in merchant marine, Netherlands, 2045
  - in vivo survival of glycerolized and frozen red blood cells, [Tullis & others] *399
  - intraosseous blood and plasma in children, [Lapshina] 1711—ab
  - massive, and hemorrhage, [Ulin & others] *1971
  - packed erythrocytes for liver cirrhosis, India, 1150
  - parental blood, hazards for measles modification, (replies) [Berryhill; and original consultant] 1170
  - safety of liquid plasma, statistical appraisal, [Sayman & others] *1735; 1781—E
- BLOOD VESSELS
  - action of acetazolamide on, India, 1800
  - cerebral arteriovenous anomalies, intracranial hemorrhage in, [Wood] 1272—ab
  - cerebral occlusive disease, neurosurgical aspects of, [Webster] 334—ab
  - injuries in supracondylar fractures of humerus in children, [Staples] *730
  - peripheral complications in diabetes, [Kramer] 2181—ab
  - roentgen study, angiographic evaluation of cerebral arteriosclerosis, [Tatelman] 352—ab
  - surgery in aged, outlook for, [Hitchcock] 1267—ab
  - tumors, management, [Stephenson] 1711—ab
- BODY
  - fat, determination, India, 2292
  - Weight: See also Obesity
  - weight disturbances from methylprednisolone, [McMahon & Gordon] *1208
- BONE MARROW
  - biopsy, Austria, 1922
  - medullary iron in acute rheumatic fever in children, [Bernheim] 1715—ab
  - proteinic and hematological changes in multiple myeloma, [Prato] 215—ab; 216—ab
- BONES: See also specific bones as Humerus
  - activation of patient with skeletal metastatic neoplasia, [Cummings & Rosenthal] *501
  - disease, alcohol-induced pain in, [Braun & Shnider] *1882
  - formation and diseases, symposium on, (Program) (Council article) 520
  - Fractures: See Fractures
  - growing, metastatic embryonal rhabdomyosarcoma in, [Caffey] 123—ab
  - hypophosphatasia, 415—E
  - intraosseous anesthesia in operations on extremities, [Okhotsky] 1825—ab
  - intraosseous blood and plasma transfusion in children, [Lapshina] 1711—ab
  - research grants announced, 80
  - tumors, osteogenic sarcoma of jaws and facial bones, [Kragh] 2304—ab
  - tumors, what cytology offers in diagnosis, [Sicard] 127—ab
- BOOKS: See *also* Book Reviews at end of letter B
  - A. M. A. discontinues publication of Glandular Physiology and Therapy, and Fundamentals of Anesthesia, 1057; 1059
  - book on medical care by Association of Teachers of Preventive Medicine, review of, (Bureau article) [Bornet] *2025
- BOOKS—Continued
  - Carl von Linné's autobiographies, Sweden, 1800
  - Gray's Anatomy, centenary celebrated, United Kingdom, 1152
  - to recommend to patient after premarital examination, [Scholten] *1171
- BOSTON UNIVERSITY
  - grants to, 1558
  - medical research building planned, 1210
- BOTTLE
  - soft drink bottle in peritoneal cavity, [Hoge & Thedieck] *10
- BOTULISM
  - clinical-neurologic study, [Castedo] 2303—ab
- BOUILLON feedings, surgical patient, [Benjamin] 2311—ab
- BOXING
  - hematuria in boxers, [Kleiman] *1633
- BRACES
  - Milwaukee, in operative treatment of scoliosis, [Blount] 327—ab
- BRADYCARDIA
  - on closure of left ventricular-right atrial shunt, [Gerbode] 2187—ab
- BRAIN
  - abscess, 47 cases, [Kerr & others] *868
  - blood flow and metabolism during acute vascular accidents, effect of vasodilators, [Feruglio] 1822—ab
  - chemistry, study at U. of Illinois, 1139
  - damage, contrecoup, with headaches, nose discharge and bilateral nerve deafness; cause, treatment, 2081
  - damage, meprobamate effect on, [Carter] 337—ab
  - disease, organic, emotional problems after, treatment, 136; (replies) [Paley; and original consultant] 2086
  - disease, Pelizaeus-Merzbacher disease, [Tyler] 1270—ab
  - electroencephalogram abnormalities in hepatic insufficiency and coma, [Bogacz] 456—ab
  - electroencephalography in control of depth of anesthesia, [Bakulev] 1164—ab
  - hemorrhage, emotional problems after, treatment, 136
  - hemorrhage, fatal mistakes in diagnosis of apoplexy, [Marquardsen] 828—ab
  - hemorrhage in cerebral arteriovenous anomalies, [Wood] 1272—ab
  - injuries, neurosurgical care of severely injured patient, [Odom] *2087
  - mucormycosis, [Smith] 2200—ab
  - occlusive vascular disease, neurosurgical aspects, [Webster] 334—ab
  - penetrating nuclear radiation effects on, [Gerstner] *381
  - surgery, lobotomy; 15-year study, [McCausland] 1271—ab
  - surgery, prefrontal lobotomy, 500 Freeman and Watts patients followed 10-20 years, [Freeman] 335—ab
  - surgery, resection of temporal lobe for convulsive disorders, [French] 334—ab
  - surgery, temporal lobectomy effect on mental condition in psychomotor epilepsy, [Alajouanine] 1410—ab
  - transforaminal curet necropsy of, postmortem tissue diagnosis, [MacHaffie] 1823—ab
  - transillumination of infant head demonstrated by case of hydranencephaly, [Griffiths] 1713—ab
  - vascular accidents, non-traumatic, diagnosis and treatment; emphasis on intracranial hemorrhage and "common stroke," [Scott] 2190—ab
- BREAST
  - abscesses, maternal, and antecedent neonatal staphylococcal infection, [Monro] 1275—ab
  - cancer, adrenalectomy in, correlate clinical results with estrogen production, [Bulbrook] 948—ab
  - cancer, adrenals and, Portugal, 2170
  - cancer, advanced, fluoxymesterone therapy in, [Kennedy] 2325—ab
  - cancer, A. M. A. Subcommittee annual report on, 1060
  - cancer, androgens in women for, [Vaccato] 950—ab
  - cancer, diagnostic meaning of calcium metabolism changes after sex steroids in, [Molinatti] 1947—ab
  - cancer, endocrine relationship to chronic cystic mastitis, [Womack] 2192—ab
  - cancer, endocrine treatment, [Nogués] 713—ab
  - cancer, hormonal treatment, sex chromatin in cell nucleus, [Ehlers] 1161—ab
  - cancer, hypophysectomy for, (United Kingdom) 316; [Baron] 949—ab; (metastatic) [Dugger] 2184—ab
  - cancer, hypophysectomy in, correlate clinical results with estrogen production, [Bulbrook] 948—ab
  - cancer in Middletown, U. S. A., [Moore] 2307—ab
  - cancer in women 35 years of age or younger, [Treves] 1940—ab
- BREAST—Continued
  - cancer, metastasizing, ovariectomy and adrenalectomy in, [Hellström] 829—ab; [Davis] 2306—ab
  - cancer, metastatic, implant pituitary with yttrium-90 for, United Kingdom, 315
  - cancer, 1627 cases, [Lavigne] 1816—ab
  - cancer, oophorectomy in, correlate results with estrogen production, [Bulbrook] 947—ab
  - cancer, pituitary ablation by means of radioactive seeds, WHO report, 1397
  - cancer, pregnancy contraindicated after surgery for? 2334
  - cancer, series of 681 patients, India, 92
  - cancer, treatment, 1228—E; (reply) [Segaloff] 2297—C
  - cystic disease, treatment, results; 5 to 18-year survey, [Hendrick] 2063—ab
  - Feeding: See Lactation
  - female, occurrence and significance of free tissue fluid in, [Ratzenhofer] 1276—ab
  - hypertrophy after reserpine, explanation of, 136
  - inflammation, endocrine relationship to breast cancer, [Womack] 2192—ab
  - nipple discharges, cytology as diagnostic aid, [Walker] 829—ab
  - surgery, pregnancy after mastectomy, 1955
  - tuberculosis, [Yeh] 1707—ab
  - tumors, sarcoma, [Botham] 714—ab; (Brazil) 802
- BREATH; Breathing: See Respiration
- BRITISH
  - doctors, are we making same mistakes made by? British GP thinks so, (Miscellany) 931
  - Empire Cancer Campaign report, 317
  - Health Service: See National Health Service
- BROADMOOR asylum for criminally insane, facts about, United Kingdom, 98
- BROMHIDROSIS
  - etiology, 1592
- BRONCHIECTASIS
  - bilateral, preparatory treatment and operation, [Spath] 1706—ab
  - climate and, 474
  - hypogammaglobulinemia and, [de Meulemeester] 712—ab
  - reversible, [Nelson] 1949—ab
  - treatment, indications and safety of bronchoscopy and bronchography, 2083
- BRONCHITIS
  - atypical epithelial changes in mice exposed to cigarette smoke, [Leuchtenberger] 223—ab
  - chronic, hydrocortisone inhalations for, [Helm] 2197—ab
  - outdoor occupations and, United Kingdom, 2045
- BRONCHOGRAPHY: See Bronchus, roentgen study
- BRONCHOSCOPY
  - indications for and safety of, 2083
- BRONCHUS
  - cancer, analytic investigations, 801 cases, [Wassner] 952—ab
  - cancer in young persons, [Hanbury] 837—ab
  - cancer, inoperable, value of radiotherapy in, [Sicher] 353—ab
  - cancer, primary, interstitial implantation for, [Henschke] 351—ab
  - cancer, treatment, results, [Burford] 1816—ab
  - cancer without roentgen findings, [Hansen] 1815—ab
  - carcinoid adenoma, diagnosis and management, [Sauer & others] *139
  - carcinoid adenoma, with solitary metastasis and carcinoid syndrome, [Stanford] 838—ab
  - roentgen study, indications for and safety, 2083
  - tuberculous tracheobronchial lymph node involvement in maturity, [le Melletier] 110—ab
  - tumors, fibroma, [Rodó] 437—ab
- BRUCELLOSIS
  - chronic valvular heart disease after, [Peery] 1810—ab
  - treatment: chloramphenicol with tetracycline, [Parravicini] 125—ab
- BRUSH, nylon, [Savill] 2319—ab
- BRUTALITY
  - parental, etiologic factor in first-degree murder, [Duncan & others] *1755
- BUERGER'S Disease: See Thromboangiitis obliterans
- BURNS
  - absorption of local anesthetics from, [Campbell & Adriani] *873
  - chorioretinal, produced by atomic flash, (guest editorial) [Byrnes] 778—E
  - lower extremity skin coverage in children, [Wynn] *154
  - third degree, grafts for, remove granulations *down to firm yellow base?* 134
  - treatment, India, 806
- BURSITIS
  - calcareous and noncalcareous, about trochanter major, [Leonard] *175

BUSINESS PRACTICE
  Business Side of Medical Practice, excerpts from brochure, 818; 935; 1155; 1262; 1401; 1691; 1806; 1932; 2050; 2176
BUSULFAN
  treatment of polycythemia vera, [Louis] *1880
BUTYL SULFANILYLUREA (carbutamide): See Sulfonylureas

BOOK REVIEWS

Abnormalities
  Congenital Anomalies of Hand and Their Surgical Treatment, [Barsky] 2203
  Hermaphroditism, Genital Anomalies and Related Endocrine Disorders, [Jones & Scott] 2079
Adams, F. D., Physical Diagnosis, 2079
Adriani, J., editor, Hospital Planning for Anesthesiologist, (by Dornette) 1729
Aegerter, E., and Kirkpatrick, J. A., Jr., Orthopedic Diseases, 471
Alcoholism, [Pfeffer] 977
Allergy
  Mould Fungi and Bronchial Asthma, Volume I, [van der Werff] 470
American Academy of Orthopaedic Surgeons Instructional Course Lectures. Volume XIV, [Raney] 1419
American Association for Health, Physical Education, and Recreation, Fit to Teach: Yearbook on Teacher Health, 1951
American Association of Clinical Chemists, Standard Methods of Clinical Chemistry. Volume II, [Seligson] 226
American College of Chest Physicians, Roentgenology of the Chest, [Rabin] 1728
American Heart Association, Cerebral Vascular Disease: Transactions of Second Conference, [Millikan] 2202
Anatomy
  Diagnostic Anatomy, [Gardner] 1590
  Handbuch der [illegible] Anatomie und His[illegible] Band 13. Nervensystem. Teil 2, Bandteile A und B, [Lubarsch & others] 1166
  Human Dissection, [Lassek] 1730
  Synopsis of Surgical Anatomy, [McGregor] 1728
Anderson, M. H., Functional Bracing of Upper Extremities, 1729
Anderson, V. E., Goodman, H. O., and Reed, S. C., Variables Related to Human Breast Cancer, 1727
Anesthesia
  Hospital Planning for Anesthesiologist, [Dornette] 1729
  Physics for the Anaesthetist, Including Section on Explosions, [Macintosh & others] 359
Athletics and Physical Education
  Methods in Physical Education, [Kozman & others] 471
  Organization and Administration of Physical Education, [Voltmer & Esslinger] 1420
Atlas
  Atlas de technique opératoire chirurgie de la main, [*Iselin & others*] 356
  Atlas der gastroenterologischen Endoskopie, [Boller] 1828
Bacteriology
  Bacterial and Mycotic Infections of Man, [*Dubos*] *2201*
  Microbiology and Epidemiology, [Thompson] 715
Baron, D. N., *Essentials of Chemical Pathology*, 817
Barsky, A. J., Congenital Anomalies of Hand and Their Surgical Treatment, 2203
Barton, R. T., Religious Doctrine and Medical Practice, 1591
Bayley, R. H., Electrocardiographic Analysis, Vol. 1, 225
Belding, D. L., Basic Clinical Parasitology, 1730
Benedict, E. B., and Nardi, G. L., The Esophagus, 1590
Bierring, W. L., History of the Department of Internal Medicine, State University of Iowa College of Medicine, 2202
Blood and Hemopoietic System
  Circulation: Proceedings of the Harvey Tercentenary Congress, [McMichael] 2327
  Etiology and Treatment of Leukemia, [Burdette] 1952
  Laboratory Medicine: Hematology, [Miale] 358
Boller, R., Atlas der gastroenterologischen Endoskopie, 1828
Boyd, W., Pathology for the Physician, 358
Braestrup, C. B., and Wyckoff, H. O., Radiation Protection, 1951
Bredow, M., Medical Assistant, 1165
Brown, J. B., and McDowell, F., Skin Grafting, 1165
Burdette, W. J., *editor*, Etiology and Treatment of Leukemia, 1952
Calder, R., Medicine and Man: Story of Art and Science of Healing, 1730
Cancer
  Advances in Cancer Research, Volume V, [Greenstein & Haddow] 470
Cancer—Continued
  Etiology and Treatment of Leukemia: *Proceedings of First Louisiana Cancer Conference*, [Burdette] 1952
  Variables Related to Human Breast Cancer, [*Anderson & others*] *1727*
Cardiovascular System
  Advances in Electrocardiography, [Kossmann] 1421
  Atrial Arrhythmias, Digitalis and Potassium, [Lown & Levine] 1729
  Auscultation of the Heart, [Ravin] 356
  Basic Cardiology, [Gumpert] 1831
  Cardiovascular Diseases, [Scherf & Boyd] 1728
  Cerebral Vascular Disease, [Millikan] 2202
  Chronic Bronchitis, Emphysema and Cor Pulmonale, [Stuart-Harris & Hanley] 2201
  Electrocardiogram Clinics, [Riseman & Sagall] 1952
  Electrocardiographic Analysis. Vol. 1, [Bayley] 225
  Fundamen*tals in Cardiology*, [*Wild*] *133*
  High Arterial Pressure, [Smirk] 470
  Reflexogenic Areas of Cardiovascular System, [Heymans & *Neil*] *1590*
  Symposium on *Non-Toxaemic Hypertension in Pregnancy*, [*Morris & Browne*] *1293*
Cave, E. F., editor, Fractures and Other Injuries, 978
Chemistry
  Clinical Enzymology, [Martin] 1831
  Essentials of Chemical Pathology, [Baron] 817
  Standard Methods of Clinical Chemistry. Volume II, [Seligson] 226
Ciba Foundation Colloquia on Ageing, Volume 4: Water and Electrolyte Metabolism in Relation to Age and Sex, [Wolstenholme & *O'Connor*] *2327*
Communicable Diseases
  Die I[illegible] Menschen und ihr[illegible] [illegible]ikuth] 358
  Infec[illegible], [Krugman & Ward] 2078
  Microbiology and Epidemiology, [Thompson] 715
  Practice of Infectious Disease, [Weinstein] 356
Cope, (Sir) Zachary, *Early Diagnosis of Acute Abdomen, 2203*
Council for International Organizations of Medical Sciences, Planning of International Meetings, 2203
Cullen, S. C., and Gross, E. G., Manual of Medical Emergencies, 2203
Deichmann, W. B., and *Gerarde, H. W.,* *Signs*, Symptoms and Treatment of Certain Acute Intoxications, 715
DePalma, A. F., *editor-in-chief*, Clinical Orthopaedics, *Number Eleven, 1166*
Diagnosis
  Diagnostic Anatomy, [Gardner] 1590
  Early Diagnosis of Acute Abdomen, [Cope] 2203
  Modern Treatment Yearbook 1958, [Wakeley] 817
  Physical Diagnosis, [Adams] 2079
Digestive System
  Atlas der gastroenterologischen Endoskopie, [*Boller*] 1828
  Diseases of Esophagus, [Terracol & Sweet] 977
  Diseases of Liver and Biliary System, [Sherlock] 1952
  Esophagus: Medical and Surgical Management, [Benedict & Nardi] 1590
  Intestinal Obstruction, [Welch] 1419
  Modern Trends in Gastroenterology (Second Series), [Jones] 715
Doctor Speaks His Mind, [Lee] 1730
Dornette, W. H. L., Hospital Planning for Anes*thesiologist, 1729*
Dow, R. S., and Moruzzi, G., Physiology and Pathology of Cerebellum, 977
Dubos, R. J., *editor*, Bacterial and Mycotic Infections of *Man*, 2201
Electricity
  Medical Electrical Equipment, [Molloy] 1830
Emergencies
  Manual of Medical Emergencies, [Cullen & *Gross*] 2203
Endocrinology
  Clinical Endocrinology, [Paschkis & others] 2202
  Diseases of Thyroid and Parathyroid Glands, [Ficarra] 2078
  Endocrine Pathology of the Ovary, [Morris & Scully] 816
  Hermaphroditism, Genital Anomalies and Related Endocrine Disorders, [Jones & Scott] 2079
Enzymes
  Clinical Enzymology, [Martin] 1831
Ethics, Medical
  Law and Ethics for Doctors, [Hadfield] 1419
Ficarra, B. J., Diseases of Thyroid and Parathyroid Glands, 2078
First Aid
  First Aid for Your Infant and Child, [Northrup] 1165
  Manual of Medical Emergencies, [Cullen & Gross] 2203
Florey, (Sir) Howard, editor, General Pathology Based on Lectures Delivered at the Sir William Dunn School of Pathology, 1421
Francis, J., Tuberculosis in Animals and Man, 133
Freeman, L., So You Want to Be Psychoanalyzed! 225
Gardner, W. D., Diagnostic Anatomy, 1590
Garrè-Stich-Bauer Lehrbuch der Chirurgie, [Stich & Bauer] 1165
Genitourinary Tract
  Hermaphroditism, Genital Anomalies and Related Endocrine Disorders, [Jones & Scott] 2079
  Operative Surgery. Volume 7: Breast, Genito-Urinary System, [*Rob* & Smith] 359
Gerard, R. W., Mirror to Physiology, 1292
Geriatrics
  Ciba Foundation Colloquia on Ageing, Volume 4, [Wolstenholme & O'Connor] 2327
  Clinical Orthopaedics. Number Eleven: Orthopaedic Surgery in Geriatric Patient, [DePalma] 1166
Gibbs, F. A., and Stamps, F. W., Epilepsy Hand*book, 1730*
Goff, C. W., editor, Congenital Anomalies of Hand and Their Surgical Treatment, (by Barsky) 2203
Greenfield, J. G., and others, Neuropathology, 1591
Greenstein, J. P., and Haddow, A., Advances in Cancer Research, Volume V, 470
Grumbach, A., and Kikuth, W., editors, Die Infektionskrankheiten des Menschen und ihre Erreger, 358
Gumpert, T. E., Basic Cardiology, 1831
Gynecology and Obstetrics
  Endocrine Pathology of Ovary, [Morris & Scully] 816
  Human Parturition: Normal and Abnormal Labor, [Miller & Evans] 1952
  Lehrbuch der Gynäkologie, [Martius] 817
  Modern Practice of Obstetrics, [Stern & Burnett] 1292
  Obstetrics and Gynecology, [Willson & others] 1591
  Operative Surgery. Volume 7: Breast, Genito-Urinary System, [Rob & Smith] 359
  Pediatric Gynecology with Sections *on* Urology and Proctology, [Schauffler] 359
  Symposium on Non-Toxaemic Hypertension in Pregnancy, [Morris & Browne] 1293
  Variables Related to Human Breast Cancer, [Anderson & others] 1727
Hadfield, S. J., Law and Ethics for Doctors, 1419
Hardy, J. D., Pathophysiology in Surgery, 2326
Harrison, T. R., and others, editors, Principles of Internal Medicine, 1292
Harvard Medical School, Fractures and Other Injuries, [Cave] 978
Harvey, William (1578-1657)
  Circulation: Proceedings of the Harvey Tercentenary Congress, [McMichael] 2327
Health
  Fit to Teach: Yearbook on Teacher Health, [Hein] 1951
  Lifetime Health Record, [Rutstein] 1829
Hein, F. V., editor, Fit to Teach, 1951
Hermaphroditism, Genital Anomalies and Related Endocrine Disorders, [Jones & Scott] 2079
Heymans, C., and Neil, E., Reflexogenic Areas of Cardiovascular System, 1590
Higgins, G. A., and Orr, T. G., Jr., Orr's Operations of General Surgery, 1727
Histology
  Die neuroallergischen Beziehungen in der Histopathologie der Multiplen Sklerose, [Lehoczky] 1828
  Handbuch der speziellen pathologischen Anatomie und Histologie. Band 13, Teil 2, Bandteile A und B, [Lubarsch & others] 1166
History of Medicine: See Medical History
Hollingshead, A. B., and Redlich, F. C., Social Class and Mental Illness, 978
Holzel, A., and Tizard, J. P. M., Modern Trends in Pediatrics (Second Series), *978*
Hospitals
  Hospital Planning for the Anesthesiologist, [Dornette] 1729
  Medical Electrical Equipment, [Molloy], 1830
Hurwitz, A., and Degenshein, G. A., Milestones in Modern Surgery, 226
Industrial Hygiene and Toxicology. Volume 1, [Patty] 1293
Infectious Diseases: See Communicable Diseases
Insurance
  Life Insurance and *Medicine*, [Ungerleider & Gubner] 2078
Internal Medicine
  Principles of Internal Medicine, [*Harrison* & others] 1292
Iselin, M., and others, Atlas de technique opératoire chirurgie de la main, 356
Jeans, P. C., Wright, F. H., and Blake, F. G., Essentials of Pediatrics, 1951

Jones, F. A., editor, Modern Trends in Gastroenterology (Second Series), 715
Jones, H. W., Jr., and Scott, W. W., Hermaphroditism, Genital Anomalies and Related Endocrine Disorders, 2079
Korkis, F. B., Recent Advances in Oto-laryngology, 226
Kossmann, C. E., editor, Advances in Electrocardiography, 1421
Kozman, H. C., Cassidy, R., and Jackson, C. O., Methods in Physical Education, 471
Krugman, S., and Ward, R., Infectious Diseases of Children, 2078
Laboratory Medicine: Hematology, [Miale] 358
Lanza, A. J., editor-in-chief, Alcoholism. (by Pfeffer) 977
Lassek, A. M., Human Dissection, 1730
Lee, R. I., A Doctor Speaks His Mind, 1730
Lehoczky, T., Die neuroallergischen Beziehungen in der Histopathologie der Multiplen Sklerose, 1828
Levine, S. Z., Anderson, J. A., and others, Advances in Pediatrics, Volume X, 1828
terature
How to Write Scientific and Technical Papers, [Trelease] 1831
wn, B., and Levine, H. D., Atrial Arrhythmias, Digitalis and Potassium, 1729
barsch, O., Henke, F., and Rössle, R., editors, Handbuch der speziellen pathologischen Anatomie und Histologie. Band 13, Teil 2, Bandteile A und B, 1166
ndeen, E. C., and Kunstadter, R. H., Care of he Premature Infant, 133
Gregor, A. L., Synopsis of Surgical Anatomy, 1728
cintosh, (Sir) Robert, Mushin, W. W., and Epstein, H. G., Physics for Anaesthetist, Including Section on Explosions, 359
cleod, I., and others, Future of the Welfare State: Seven Oxford Lectures, 357
Michael, J., editor, Circulation: Proceedings of the Harvey Tercentenary Congress, 2327
rtin, G. J., editor, Clinical Enzymology, 1831
rtius, H., Lehrbuch der Gynäkologie, 817
ssachusetts General Hospital, Fractures and Other Injuries, [Cave] 978
dical Assistant, [Bredow] 1165
dical History
History of the Department of Internal Medicine, State University of Iowa College of Medicine, [Bierring] 2202
Human Dissection: Its Drama and Struggle, [Lassek] 1730
Medicine and Man: Story of Art and Science of Healing, [Calder] 1730
dical Jurisprudence
Forensic Medicine, [Simpson] 817
Law and Ethics for Doctors, [Hadfield] 1419
dical Records
Lifetime Health Record, [Rutstein] 1829
dicine
A Doctor Speaks His Mind, [Lee] 1730
Life Insurance and Medicine, [Ungerleider & Gubner] 2078
Medicine and Man: Story of Art and Science of Healing, [Calder] 1730
Negroes and Medicine, [Reitzes] 1829
Religious Doctrine and Medical Practice, [Barton] 1591
etings
Planning of International Meetings, [Council for International Organizations of Medical Sciences] 2203
nninger, K., Theory of Psychoanalytic Technique, 1729
tabolism
Ciba Foundation Colloquia on Ageing, Volume 4: Water and Electrolyte Metabolism in Relation to Age and Sex, [Wolstenholme & O'Connor] 2327
ale, J. B., Laboratory Medicine: Hematology, 358
lestones in Modern Surgery, [Hurwitz & Degenshein] 226
ller, N. F., Evans, T. N., and Haas, R. L., Human Parturition, 1952
llikan, C. H., editor, Cerebral Vascular Disease, 2202
lloy, R. E., editor, Medical Electrical Equipment, 1830
rris, J. M., and Scully, R. E., Endocrine Pathology of Ovary, 816
rris, N. F., and Browne, J. C. M., editors, Symposium on Non-Toxaemic Hypertension in Pregnancy, 1293
groes and Medicine, [Reitzes] 1829
urology
Cerebral-Palsied Child: Guide for Parents, [Phelps & others] 1830
Cerebral Palsy in Childhood, [Woods] 816
Cerebral Vascular Disease, [Millikan] 2202
Die neuroallergischen Beziehungen in der Histopathologie der Multiplen Sklerose, [Lehoczky] 1828
Epilepsy Handbook, [Gibbs & Stamps] 1730
Neurology—Continued
Handbuch der speziellen pathologischen Anatomie und Histologie. Band 13: Nervensystem. Teil 2, Bandteile A und B, [Lubarsch & others] 1166
Neuropathology, [Greenfield & others] 1591
Physiology and Pathology of Cerebellum, [Dow & Moruzzi] 977
Northrup, E., First Aid for Your Infant and Child, 1165
Nurses and Nursing
Medical Assistant, [Bredow] 1165
Obstetrics: See Gynecology and Obstetrics
Ophthalmology
Systemic Ophthalmology, [Sorsby] 1830
Orr's Operations of General Surgery, [Higgins & Orr] 1727
Orthopedics
American Academy of Orthopaedic Surgeons Instructional Course Lectures. Volume XIV, [Raney] 1419
Clinical Orthopaedics. Number Eleven, [DePalma] 1166
Fractures and Other Injuries, [Cave] 978
Functional Bracing of the Upper Extremities, [Anderson] 1729
Orthopedic Diseases, [Aegerter & Kirkpatrick] 471
Otorhinolaryngology
Hearing Therapy for Children [Streng] 2326
Recent Advances in Oto-laryngology, [Korkis] 226
Pack, G. T., and Ariel, I. M., Tumors of the Soft Somatic Tissues, 1420
Parasitology
Bacterial and Mycotic Infections of Man, [Dubos] 2201
Basic Clinical Parasitology, [Belding] 1730
Mould Fungi and Bronchial Asthma, Volume I, [van der Werff] 470
Paschkis, K. E., Rakoff, A. E., and Cantarow, A., Clinical Endocrinology, 2202
Pathology
Essentials of Chemical Pathology, [Baron] 817
General Pathology Based on Lectures Delivered at the Sir William Dunn School of Pathology, [Florey] 1421
Neuropathology, [Greenfield & others] 1591
Pathology for the Physician, [Boyd] 358
Principles of Internal Medicine, [Harrison & others] 1292
Text on Systemic Pathology. Volume I, [Saphir] 1421
Patton, E. F., Pediatric Index: Guide to Symptomatological Diagnosis and Current Management, 1420
Patty, F. A., editor, Industrial Hygiene and Toxicology. Volume I, 1293
Pediatrics
Advances in Pediatrics. Volume X, [Levine & others] 1828
Care of the Premature Infant, [Lundeen & Kunstadter] 133
Cerebral-Palsied Child: Guide for Parents, [Phelps & others] 1830
Cerebral Palsy in Childhood, [Woods] 816
Essentials of Pediatrics, [Jeans & others] 1951
First Aid for Your Infant and Child, [Northrup] 1165
Hearing Therapy for Children, [Streng] 2326
Infectious Diseases of Children, [Krugman & Ward] 2078
Modern Trends in Pediatrics (Second Series), [Holzel & Tizard] 978
Pediatric Gynecology with Sections on Urology and Proctology, [Schauffler] 359
Pediatric Index: Guide to Symptomatological Diagnosis and Current Management, [Patton] 1420
Surgery in Infancy and Childhood, [White & Dennison] 471
Pfeffer, A. Z., Alcoholism, 977
Pharmacology and Therapeutics
Atrial Arrhythmias, Digitalis and Potassium, [Lown & Levine] 1729
Modern Treatment Yearbook 1958, [Wakeley] 817
Phelps, W. M., Hopkins, T. W., and Cousins, R., Cerebral-Palsied Child: Guide for Parents, 1830
Physics for Anaesthetist, [Macintosh & others] 359
Physiology
Mirror to Physiology, [Gerard] 1292
Planning of International Meetings, [Council for International Organizations of Medical Sciences] 2203
Psychiatry
Social Class and Mental Illness, [Hollingshead & Redlich] 978
Psychoanalysis
So You Want to Be Psychoanalyzed! [Freeman] 225
Theory of Psychoanalytic Technique, [Menninger] 1729
Rabin, C. B., editor, Roentgenology of the Chest, 1728
Radiation Protection, [Baestrup & Wyckoff] 1951
Raney, R. B., editor, American Academy of Orthopaedic Surgeons Instructional Course Lectures. Volume XIV, 1419
Ravin, A., Ausculation of the Heart, 356
Reitzes, D. C., Negroes and Medicine, 1829
Religious Doctrine and Medical Practice, [Barton] 1591
Respiratory Tract
Chronic Bronchitis, Emphysema and Cor Pulmonale, [Stuart-Harris & Hanley] 2201
Rheumatic Disease
Progress in Arthritis, [Talbott & Lockie] 357
Riseman, J. E. F., and Sagall, E. L., Electrocardiogram Clinics, 1952
Rob, C., and Smith, R., editors, Operative Surgery. Volume 7, 359
Roentgenology of the Chest, [Rabin] 1728
Rutstein, D. D., Lifetime Health Record, 1829
Saphir, O., editor, Text on Systemic Pathology. Volume 1, 1421
Schauffler, G. C., Pediatric Gynecology with Sections on Urology and Proctology, 359
Scherf, D., and Boyd, L. J., Cardiovascular Diseases, 1728
Schools
Fit to Teach, [Hein] 1951
Schools, Medical
History of the Department of Internal Medicine, State University of Iowa College of Medicine, [Bierring] 2202
Secretaries
Medical Assistant, [Bredow] 1165
Seligson, D., editor, Standard Methods of Clinical Chemistry. Volume II, 226
Sex
Hermaphroditism, Genital Anomalies and Related Endocrine Disorders, [Jones & Scott] 2079
Sherlock, S., Diseases of Liver and Biliary System, 1952
Simpson, K., Forensic Medicine, 817
Smirk, F. H., High Arterial Pressure, 470
Social Class and Mental Illness, [Hollingshead & Redlich] 978
Socialism
Future of Welfare State: Seven Oxford Lectures, [Macleod & others] 357
Socialized Medicine
Law and Ethics for Doctors, with a Section on General Practice in the National Health Service, [Hadfield] 1419
Sollars, R. E., editor, Functional Bracing of Upper Extremities, (by Anderson) 1729
Sorsby, A., editor, Systemic Ophthalmology, 1830
Stern, D. M., and Burnett, C. W. F., Modern Practice of Obstetrics, 1292
Stich, R., and Bauer, K. H., editors, Garrè-Stich-Bauer Lehrbuch der Chirurgie, 1165
Streng, A., Hearing Therapy for Children, 2326
Stuart-Harris, C. H., and Hanley, T., Chronic Bronchitis, Emphysema and Cor Pulmonale, 2201
Surgery
Atlas de technique opératoire chirurgie de la main, [Iselin & others] 356
Atlas der gastroenterologischen Endoskopie, [Boller] 1828
Congenital Anomalies of Hand and Their Surgical Treatment, [Barsky] 2203
Diseases of Esophagus, [Terracol & Sweet] 977
Esophagus, [Benedict & Nardi] 1590
Garrè-Stich-Bauer Lehrbuch der Chirurgie, [Stich & Bauer] 1165
Illustrated Preoperative and Postoperative Care, [Thorek] 1831
Intestinal Obstruction, [Welch] 1419
Milestones in Modern Surgery, [Hurwitz & Degenshein] 226
Operative Surgery. Volume 7, [Rob & Smith] 359
Orr's Operations of General Surgery, [Higgins & Orr] 1727
Pathophysiology in Surgery, [Hardy] 2326
Skin Grafting, [Brown & McDowell] 1165
Surgery in Infancy and Childhood, [White & Dennison] 471
Synopsis of Surgical Anatomy, [McGregor] 1728
Talbott, J. H., and Lockie, L. M., editors, Progress in Arthritis, 357
Technologists
Medical Assistant, [Bredow] 1165
Terracol, J., and Sweet, R. H., Diseases of Esophagus, 977
Thompson, L. R., Microbiology and Epidemiology, 715
Thorax
Roentgenology of the Chest, [Rabin] 1728
Thorek, P., Illustrated Preoperative and Postoperative Care, 1831
Toxicology
Industrial Hygiene and Toxicology. Volume I, [Patty] 1293
Signs, Symptoms and Treatment of Certain Acute Intoxications, [Deichmann & Gerarde] 715

Trauma
  Fractures and Other Injuries, [Cave] 978
Trelease, S. F., How to Write Scientific and Technical Papers, 1831
Tuberculosis
  Tuberculosis in Animals and Man, 133
Tumors
  Tumors of Soft Somatic Tissues, [Pack & Ariel] 1420
Ungerleider, H. E., and Gubner, R. S., editors, *Life Insurance and Medicine,* 2078
Urology: See Genitourinary Tract
van der Werff, P. J., Mould Fungi and Bronchial *Asthma, Volume I,* 470
Voltmer, E. F., and Esslinger, A. A., Organization and Administration of Physical Education, 1420
Wakeley, Sir Cecil, editor, Modern Treatment Yearbook 1958, 817
Weinstein, L., *Practice of Infectious Disease,* 356
Welch, C. E., Intestinal Obstruction, 1419
White, M., and Dennison, W. M., Surgery in *Infancy and Childhood,* 471
Wild, J. B., Fundamentals in Cardiology, 133
Willson, J. R., and others, Obstetrics and Gynecology, 1591
Wolstenholme, G. E. W., and O'Connor, M., editors, Ciba Foundation Colloquia on Ageing, *Volume 4,* 2327
Woods, G. E., Cerebral Palsy in Childhood, 816

C

CADAVERS
  inadequate supply, 1502
CALCIFICATION
  in gastrointestinal malignancy, [Matthews] 332—ab
  intracranial, after tuberculous meningitis in children, [Lorber] 958—ab
  of *adrenals, significance and therapy* in 3-year-old girl, (reply) [Goldzieher] 1170
CALCIUM
  absorption, vitamin D, and sunbathing, 1953
  Carbimide: See Carbimide
  Disodium Edathamil: See Edathamil
  in etiology of arteriosclerosis, 1297
  intake, relation to muscle cramps, 2206
  metabolism changes, diagnostic meaning after sex steroids in *mammary* and *prostatic* cancer, [Molinatti] 1947—ab
  metabolism, psoriasis relationship, 716
  restriction to prevent urinary calculi after paralytic poliomyelitis, [Plum] *1302
  trochanteric syndrome, calcareous and noncalcareous tendonitis and bursitis, [Leonard] *175
  urinary excretion in patients with calcium stone of renal origin, [Hodgkinson] 1820—ab
  utilization from dried and fresh milk, relation of intake to teeth formation and prevention of caries, 844
CALORIES
  skin *absorption of,* 1169
CANADA
  hospitals approved for internships in, 553
  medical education in, 58th annual *report,* 1459
CANCER
  after irradiation, United Kingdom, 2295
  breast and genital, A. M. A. Subcommittee annual report on, 1060
  British Empire Cancer Campaign report, 317
  carcinogenesis, France, 1255
  carcinogens *fixed by* histamine and *noncarcinogens* not so fixed, France, 309
  Diagnosis: See also specific organ or region
  diagnosis, palpable cervical lymph nodes, [Sage] *496
  effusions in, effect of prednisone on, [Franco & *others*] *1645
  etiology: endocrine carcinogenesis, New Zealand, 210
  etiology: possible role of smegma in cancer of *cervix,* [*Heins*] 2312—ab
  hyperfibrinemia in, France, 1797
  in *Africa,* United Kingdom, 928
  in Children: See Children
  metastases of retina, case report and pathology, [Kennedy] 1283—ab
  metastases, *pulmonary,* France, 309
  metastasis to cancer, [Gore] *1724—ab*
  metastatic, alcohol-induced pain in, [Braun & Shnider] *1882
  metastatic, *from* thyroid, *treatment,* 1953
  metastatic, in pelvis from rectum, treatment, 472
  metastatic, mammary, implant pituitary with yttrium-90 for, United Kingdom, 315
  metastatic, mammary, ovariectomy and adrenalectomy *in, [Hellström] 829—ab; [Davis]* 2306—ab
  metastatic, ocular, treatment, [Buxeda] 345 *—ab*
  metastatic, of breast, transection of hypophyseal stalk for, [Dugger] 2184—ab
  metastatic, skeletal, activation of patient with, [Cummings & Rosenthal] *501
CANCER—Continued
  mortality, report on, 299
  of stomach after gastric resection for peptic ulcer, [Cote] 1160—ab
  papillary, of choroid plexus, [Portugal] 2190—ab
  plasma amino acids in, India, 2168
  precancerous *condition: colon polyps,* Brazil, 430
  precancerous conditions: pilonidal cysts, [Matt] 2311—ab
  public's views on, United Kingdom, 1573
  research and treatment, Hunter Radiation Therapy Center dedicated, *Conn.,* 1665
  research grants by USPHS, 911
  smoking and, research on, United Kingdom, 212
  survival, [Archibald] 1930—C
  Treatment: See also specific organ or region
  treatment, cobalt-60 for buccal *cancer,* [Stuhl] 1824—ab
  treatment, India, 1925
  treatment, interstitial radiation of pituitary with yttrium 90, [Dogliotti] 1289—ab
  treatment of advanced type, E-39, [Brunschwig] 964—ab
CANDIDA: See Monilia; Moniliasis
CAPILLARIES
  hemorrhagic disorder with antihemophilic globulin deficiency, [Valberg] 2180—ab
CARBAZOCHROME
  control bleeding at operation, [Calnan] 1160—ab
CARBIMIDE
  citrated calcium, in alcoholism, [Mitchell] *2008
CARBOHYDRATES
  dietary, *effects* on cholesterolemia and atherogenesis in cockerels on high-fat, high-cholesterol mash, [Stamler] 976—ab
  metabolism and injury, India, 1799
CARBON DIOXIDE
  combining power, test for, 2328
CARBON TETRACHLORIDE
  toxicity: poisoning in 2 hairdressers, [Warshaw] 710—C
CARBONIC ANHYDRASE
  Inhibitors: See Acetazolamide
CARBUTAMIDE: See Sulfonylureas
CARCINOID
  bronchial adenoma with solitary metastasis and functioning carcinoid syndrome, [Stanford] 838—ab
  functioning, diagnosis, management, [Sauer & others] *139
  functioning, syndrome, with scleroderma, [Zarafonetis] 940—ab
CARCINOMA: See Adenocarcinoma; Cancer; [illegible]
[illegible]
[illegible] correlation with [illegible] 'erri] 975—ab
[illegible] [Schroeder] 1697—ab
  detection, mobile unit x-ray survey, [Feig] 841—ab
  Hypertensive: See Blood Pressure, High
  [illegible] [van Buchem] 1698—ab
  [illegible] itis and bilateral [illegible] 108—ab
[illegible]
  [illegible] n, [Walsh] 1809—ab
  factors in syncope in healthy young adults, [Dermksian & Lamb] *1200
  intracranial arteriovenous aneurysms effects on, [Höök] 335—ab
  research institute at U. of California, 1380
  roentgen features of Bland-White-Garland syndrome, [Lang] 2076—ab
  roentgen study, selective, in perforation of heart during catheterization, [Escher] 1696—ab
CAROTID GLAND
  tumors, [Basto] 2186—ab
CAROTID SINUS
  stimulation affect paroxysmal atrial fibrillation? 1169
CARPAL TUNNEL SYNDROME
  [Lyons] 1700—ab
CARROLL studies on costs of medical education, 1472
CASCARA poisoning, United Kingdom, 316
CASTLE'S INTRINSIC FACTOR: See Intrinsic Factor
CASTRATION: See Sterilization, Sexual
CASUALTIES
  mass, management and Flint tornado, [Lyttle] 1826—ab
CATARACT
  experimental, India, 2293
  surgery for immature cataract, 2207
  surgery, isolation stress in, [Ziskind] *1427
  Werner's syndrome, autopsied case, [Perloff] 325—ab
CATHARTICS
  cascara poisoning, United Kingdom, 316
CATHETERIZATION: See also under Heart
  of aorta, percutaneous left ventricular puncture with, [Fleming] 447—ab
  of hepatic vein to determine portal pressure by direct puncture during operation, [Bücherl] 432—ab
CATHETERS
  indwelling, in treatment of perineal urethral diverticulum after ischium removal, [Comarr & Bors] *2000
CATHOMYCIN: See Novobiocin
CELLS
  cytodiagnosis in cancer of cervix, [Cutts] 337—ab; [Berg] 1161—ab
  cytologic-colposcopic observations of ectocervix of pregnancy, [Lang] 437—ab
  cytologic examination of nipple discharges as diagnostic aid, [Walker] 829—ab
  cytologic observations on systemic involvement in Whipple's disease, [Sieracki] 2199—ab
  cytologic screening for uterine cancer, (*through physicians' offices*) [Calabresi & others] *243 (United Kingdom) 2174
  cytomegalic-inclusion disease in adult, [Fisher] 349—ab
  esophageal cytology by gauze-sponge smear technique, [Hershenson & others] *1871
  exfoliative cytology in diagnosis of cancer of pancreas, biliary tract and duodenum, [Raskin] 440—ab; [Wenger] 441—ab
  exfoliative cytology of stomach, Brazil, 1251
  Inter-Society Cytology Council meeting, 1384
  L. E.: See Lupus Erythematosus
  nucleus, sex chromatin in, after hormones for mammary carcinoma, [Ehlers] 1161—ab
  optimum spacing of repeat follow-up of *Papanicolaou smears,* [Schulz & *others*] *248
  Papanicolaou smear in diagnosis of carcinoma *of uterine cervix and fundus,* [Anderson] 830—ab
  somatic, chromatic mass in nuclei to *determine* sex, India, 1924
  vaginal cytology, India, 2041; (and uterine bleeding) 2292
  what *cytology offers* in *diagnosis* of bone tumors, [Sicard] 127—ab
CEMENT, pneumonoconiosis from, [Baader] 1721—ab
CENSUS
  region and states, internships by, 523; 524
CEPHALALGIA
  spinal-tap, -technigue to avoid, [Brocker] *261; (correction) 913
CEREBELLUM
  ataxia, acute, of undetermined origin in childhood, [Walcher] 1941—ab
  disturbances in Refsum's syndrome, *United* Kingdom, 927
CEREBROSPINAL FLUID
  neuraminic acid deficiency in schizophrenia, [Bogoch] 1411—ab
  virus in Coxsackie B virus infection, [Utz & Shelokov] *264
CESAREAN SECTION
  analysis of 1344, India, 2169
  evaluation of newborn infant, [Apgar & others] *1985
  for cephalopelvic disproportion after previous vaginal deliveries, [Davila] 2069—ab
  previous, *labor after, India, 2042*
CHEESE cause elevated serum cholesterol level? 1294
CHEMICALS
  A. M. A. Chemical Laboratory annual report, 1063
  eye injuries, water *in emergency treatment* of, (Council report) 47
  identification of hazardous ingredients, draft model bill requiring proper *labelling,* 1062
  tests for intoxication, *interpretation* of, (Committee report) [Turner & *others*] **1359*
CHEMODECTOMA
  of carotid body, [Basto] 2186—ab
CHEMOPALLIDECTOMY
  two years' experience with, [Paxton & Dow] *755
CHEMOTHERAPY: See also under specific drugs
  in pulmonary tuberculosis of doubtful activity, United Kingdom, 212
  of choriocarcinoma and related trophoblastic *tumors in women,* [Hertz & others] *845; 894—E
  resected tuberculous lung *lesions* after, pathology and bacteriology, [Cotter] 713—ab
CHEST: See Thorax
CHICAGO MEDICAL SCHOOL
  speakers bureau organized by, 294
  10 years accredited and approved, 2029
CHICKENPOX
  effects on primary tuberculosis, (Brazil) 430; [Moraes] 711—ab
  neonatal, case report with isolation of virus, [Ehrlich] 1277—ab
CHILDREN
  accidents, survey, [Fowler] 1820—ab

- CHILDREN—Continued
  - adenovirus infections in, comments on vaccination, [Evans] 2077—ab
  - A. M. A. Committee on Child Care, annual report, 1108
  - American youth, physical fitness, annual report, 1076
  - appendicitis in, 1,358 cases, [Longino] 1279—ab
  - aseptic meningitis in Manitoba, [Witt] 339—ab
  - asthma in, Denmark, 919
  - asthma in, pulmonary atelectasis in, [Luhr] 2194—ab
  - asthmatic, follow-up on fate of 298, [Ryssing] 1942—ab
  - asthmatic, physical conditioning program for, [Scherr & Frankel] *1996
  - athletics for, competitive, [Hoxie] *1439
  - athletics for, desirable, [Maksim] *1431
  - athletics for, educational aspects of, [Hein] *1434
  - blinking in, cause, therapy, 137
  - cancer (bronchogenic) in, [Hanbury] 837—ab
  - cancer in, adrenocortical, with excessive aldosterone production and Cushing syndrome, [Jackson] 1701—ab
  - cerebellar ataxia (acute) of undetermined origin in, [Walcher] 1941—ab
  - Coxsackie infection serious in, [Hosier] 1941—ab
  - determine genetic sex in, reliability of polymorphonuclear leukocyte morphology, [Cooper] 831—ab
  - diabetes in, nutritional management, (Council report) [Jackson] *42
  - diabetic, insulin-producing capacity of pancreas of, [Klein] 1718—ab
  - epilepsy in, acetazolamide for, [Holowach] 955—ab
  - fitness programs, implications of longitudinal research, [McCammon & Sexton] *1440
  - growth, statistics on, 2159
  - heart disease in, bacterial endocarditis in, [Cutler] 2316—ab
  - hemolytic and hypochromic anemia and elevated cold agglutinins in 7-year-old, (Diagnostic Problems) [Kushner & Szanto] *1013
  - hepatosplenomegaly in, Brazil, 1254
  - Hospitals for: See Hospitals, children's
  - humerus fractures in, supracondylar, complications and problems of traction treatment, [Staples] *730
  - hydroceles (primary) in, pathogenesis and treatment, [McKay] 1936—ab
  - hyperthyroidism in, [Hyde] 1718—ab
  - hypovitaminosis C and osteomyelitis in, [della Casa] 1819—ab
  - iatrogenic diseases in, 895—E
  - in hospitals, (United Kingdom) 809; 1376—E
  - inguinal hernias in, early surgery for, [Kiesewetter] 1711—ab
  - "insulitis" in early juvenile diabetes, [LeCompte] 2199—ab
  - intestinal protozoa and helminth acquisition by, in Egypt, [Kuntz] 1282—ab
  - intraosseous blood and plasma transfusion in, [Lapshina] 1711—ab
  - juvenile delinquency, United Kingdom, 1153
  - Korean, admitted to United States, A. M. A. resolution on, 70; 2150
  - leukemia evolution in course of treatment, [Chaptal] 960—ab
  - lower extremity skin coverage in, [Wynn] *154
  - megacolon and its treatment in, [Doletski] 312—ab
  - myasthenia gravis in, [Sampayo] 1282—ab
  - myopia in, dietary treatment, [Gardiner] 346—ab
  - nephritis in, (Norway) 310; (acute glomerular, India) 2043
  - nephrolithiasis in, diagnosis, [Diligenskaya] 341—ab
  - nephrosis in, prolonged intermittent steroids for, [Lange & others] *377
  - pericarditis in, acute benign, [Bono] 833—ab
  - peritonitis in, diffuse bacterial, intraperitoneal oxytetracycline and tetracycline for, [Soave] 965—ab
  - phenylketonuria in, chemical and clinical observations during treatment, [Berry] 462—ab
  - poisoning, accidental, control of, [Cann & others] *717
  - poisoning, exchange transfusion for, [Bruton] 1820—ab
  - poisoning from salicylates, [Cann] 1577—ab
  - portal venography in, India, 921
  - postpneumonic lung abscess in, lobectomy *for, [Moore] 2308*—ab
  - postpneumonic pseudo air cysts in, [Schlager] 1817—ab
  - pulmonary tuberculosis in, incidence of morbidity and disorders secondary to serofibrinous pleurisy in, before and after antibiotic era, [Batini] 2317—ab
- CHILDREN—Continued
  - renal disease (chronic) in, correlate clinical findings with morphology, [Vernier] 1942—ab
  - respiratory house-dust allergy in, [Mande] 1720—ab
  - respiratory illness epidemic in, *effect of* influenza immunization on, [Glazier] 460—ab
  - rheumatic fever (acute) in, medullary iron in, [Bernheim] 1715—ab
  - school, accidents among, Mich., 419
  - school, hearing screening test method for, 1832
  - *school, physical examination for,* tuberculin test in, (replies) [Faber; and original consultant] 981
  - Sigmamycin in pediatrics, [Felder] 2318—ab
  - significance of persistent and recurrent urinary infection in, [Forsythe] 2320—ab
  - sleeping positions of, especially lying on stomach, 1592
  - small, examination for muscle weakness in, [Johnson] *1306
  - staphylococcic pneumonia in, [Hendren & Haggerty] *6; (cortisone for) [Bühler] 222—ab
  - staphylococcus empyema in, [Sia] 1412—ab
  - surgical ascariasis in, 50 cases, [Fernando] 1407—ab
  - traineeships in child psychiatry, Mass., 1140
  - tuberculous meningitis in, intracranial calcification after, [Lorber] 958—ab
  - tuberculous meningitis in, treatment, [Shvedova] 1717—ab
  - tumors in, hemangiomas, conservative treatment, [Blackfield] 1710—ab
  - tumors in, lymphangioma of genitalia, [Gueukdjian] 1279—ab
  - tumors in, lymphosarcoma, [Rosenberg] 1943—ab
  - *tumors in, recurrent pheochromocytoma in* previously treated child, [Cane] 464—ab
  - ulcer disease in, [Hatfield] 2192—ab
  - under 5, poliovirus in, United Kingdom, 2296
  - vesicoureteral reflux in, [Jones] 1579—ab; (significance) [Politano] 1821—ab
  - virus infections of lower respiratory tract and Stevens-Johnson syndrome in, [Hölscher] 959—ab
  - young, obesity in, treatment, 1167
  - young, poliomyelitis antibodies before and after vaccination, [Buser] 220—ab
- CHLORAMPHENICOL
  - clinical trials with, India, 1256
  - hazards of therapy, [Herrell] *1875
  - *treatment plus tetracycline in brucellosis,* [Parravicini] 125—ab
- CHLORIDES
  - [illegible] acidosis in chronic pyelo- [illegible] 215—ab
  - [illegible] Chloramphenicol
  - [illegible] mful? 2334
  - treatment of leukemia, clinical evaluation, [Ellison] 1584—ab
- CHLOROQUINE
  - phosphate therapy, corneal complication of, [Zeller & Deering] *2263
  - treatment of active rheumatoid arthritis, [Erlendsson] 964—ab
  - treatment of arthritis, Denmark, 208; [Erlendsson] 964—ab
- CHLOROTHIAZIDE
  - ammonia intoxication in cirrhosis treated with, [Magid & others] *35
  - as hyperuricacidemic agent, [Oren & others] *2128
  - clinical and laboratory studies with, [Watson] 468—ab; (correction) 1146
  - clinical evaluation as oral diuretic, [Herrmann] 2194—ab
  - effects on renal electrolyte excretion, [Lassen] 2196—ab
  - effects on water and electrolyte excretion in preeclampsia, [de Alvarez & O'Lane] *2226
  - potentiate antihypertensive therapy by, [Rochelle & others] *410
  - toxicity: purpura, [Jaffe & Kierland] *2264
  - *treatment of cardiac edema, [Richterich] 2194*—ab
  - treatment of edema, [Michelsen] 2196—ab
  - treatment of edema in pregnancy, [Chesley] 2071—ab
- CHLORPROMAZINE
  - toxicity: jaundice, clinical course, hepatic function tests, pathology, [Gebhart] 107—ab
  - toxicity: jaundice, Israel, 2044
- CHLORPROPAMIDE: See Sulfonylureas
- CHLORQUINALDOL
  - treatment of giardiasis, Brazil, 1391
- CHLOTRIDE: See Chlorothiazide
- CHOCOLATE, caries-producing potential of, [Mueller] 436—C
- CHOL—; CHOLE—: See Bile Ducts; Biliary Tract; Gallbladder
- CHOLERA
  - outbreak in Nepal, 201
- CHOLESTEROL: See also Blood cholesterol
  - dietary, and fat, hypercholesteremia induced in monkeys by, [Cox] 969—ab
  - fed cockerels, effects of dietary proteins, methionine and vitamins on plasma lipids and atherogenesis in, [Stamler] 976—ab
  - *high, high-fat mash, effects of dietary protein* and carbohydrate on cholesterolemia and atherogenesis in cockerels on, [Stamler] 976—ab
- CHOLINESTERASE: See Anticholinesterase
- CHOREA
  - acquired choreiform movements, chemopallidectomy for, [Paxton & Dow] *755
  - *rheumatic fever and, connection between,* France, 91
- CHORIOADENOMA
  - chemotherapy of, [Hertz & others] *845; 894—E
- CHORIOCARCINOMA
  - related throphoblastic tumors in women and, chemotherapy of, [Hertz & others] *845; 894—E; (folic acid and purine antagonists) [Li] 1416—ab
- CHORIORETINITIS
  - diagnostic importance in congenital toxoplasmosis, [Fair] *250
- CHOROID
  - chorioretinal burns produced by atomic flash, (guest editorial) [Byrnes] 778—E
  - plexus, papillary carcinoma of, [Portugal] 2190—ab
- CHROMATIN: See Sex chromatin
- CHROMOSOMAL SEX: See under Sex
- CHRONICALLY ILL: See Disease, chronic
- CHYMAR: See Chymotrypsin
- CHYMOTRYPSIN
  - desoxyribonuclease with, to reduce sputum viscosity, United Kingdom, 2173
- CIGARETTES: See Tobacco
- CITIZENSHIP: See also United States citizens
  - doctor's place in public affairs, (Miscellany) [Judd] *99
- CITRATES
  - intoxication, (United Kingdom) 926; [Ludbrook] 1709—ab
- CITY—FARM WEEK
  - annual report of PR Department on, 1051
- CIVIL AERONAUTICS ADMINISTRATION (CAA): See Aviation
- CIVIL DEFENSE: See also Disasters
  - A. M. A. Council on National Defense, annual report, 1068
  - *Civil Defense Review*, publication of, Council report on, 1072
  - Commission on National Emergency Medical Care Plan, annual report, 1071
  - conference for county societies (program) (Council conference) 906; (annual report on) 1071; (highlights) [Medicine at Work] 1897
  - consolidate Federal Civil Defense Administration and Office of Defense Mobilization, 1070
  - counteract mock alert shortages with substitutions, [Medicine at Work] 773
  - elevation in FCDA of health and medical affairs position, 1070
  - emergency hospital unit for, Colo., 2155
  - evaluate task force material in emergency medical care study, [Medicine at Work] 773
  - health services, proposed FCDA delegation of responsibilities for, 1070
  - Joint Committee on Medical Education for National Defense, reports, 1072; 1542
  - medical, activities, annual report on, 1069
  - medical preparedness, [Hays] *254
  - national conference, annual report on, 1071
  - resolution that A. M. A. recommend plan to use reserve units and individuals to supplement operations, 2150
  - workshop sessions, [Medicine at Work] 773
- CLAMS, hard-shelled, allergy to, 982
- CLAUDICATION
  - intermittent, vitamin E for, [Livingstone] 2195—ab
- CLERGYMEN: See Religion
- CLERKSHIP
  - clinical, for senior medical students to replace first year interns, A. M. A. resolution on, 65
  - clinical, training program in Army, 1536
- CLIMACTERIC: See Menopause
- CLIMATE
  - emphysema, bronchiectasis and, 474
- CLINIC on recognition and management of respiratory acidosis, (Illustrated Film Reviews) [Smart & others] *2054
- CLINICS
  - teen-age, 288—E
- CLOACA
  - with non-adrenal female pseudohermaphroditism, [Sieber] 2072—ab
- COBALT
  - radiation in primary failure of anterior pituitary with irregular menstruation and sterility? 1732
  - radioactive, diagnostic value of radioactive vitamin B_{12}, [Pitney] 442—ab

COBALT—Continued
  radioactive, for buccal cancers, trial application, [Stuhl] 1824—ab
  radioactive, Schilling test in diagnosis of pernicious anemia and allied conditions, [Abels] 442—ab
COCAINE
  absorption of local anesthetic, [Campbell & Adriani] *873
CODEINE
  morphine liberation from, [Pærregaard] 1721—ab
COFFIN, LONNIE A., A. M. A. General Practitioner award to, (photos) 2147—E; 2274
COGAN'S SYNDROME: See Keratitis, interstitial
COHN ADL BLOOD FRACTIONATOR
  biomechanical equipment for long-term preservation of erythrocytes, [Ketchel & others] *404
COITUS
  headaches during, cause, treatment, 2081
  testicular pain during, 15 years after crushing injury, treatment, 1956
COLD: See also Freezing; Hypothermia, Artificial
  agglutinins elevated in 7-year-old child with hemolytic and hypochromic anemia, (Diagnostic Problems) [Kushner & Szanto] *1013
  conization, advantages of, new instrument, [Fleming] *886
  icy nose in healthy woman going through menopause, cause, 2084
COLE, GEORGE EDWARD, wanted by F. B. I., (photo) 1384
COLIC
  biliary, diazotization rate of blood bilirubin in diagnosis, [Schalm] 2061—ab
COLISEPSIS: See Escherichia
COLITIS
  amebic, rectal biopsy in diagnosis of, [Juniper] 127—ab
  ulcerative, [Hughes] 1701—ab
  ulcerative, and biliary cirrhosis, treatment, 1297
  ulcerative, and osteoporosis, unusual features, 1426
  ulcerative, arthritis with, [Bywaters] 819—ab
  ulcerative, triamcinolone for, United Kingdom, 1258
COLLAGEN DISEASE
  relation to amyloidosis, [Teilum] 1813—ab
COLLEGE: See also University
  campus, outbreak of infectious hepatitis on, [Clark] 132—ab
  degrees, medical schools having entering classes consisting predominantly of students with, 1514
  records of first-year medical students, 1512
COLON
  cancer under age of 40 [Ezzo] 1405—ab
  chest pain of colon origin, [Palmer] 1702—ab
  diverticulosis, hiatus hernia, and cholelithiasis, association of, [Foster & Knutson] *257
  megacolon and its treatment in children, [Doletski] 342—ab
  megacolon, operative treatment, [Noordijk] 455—ab
  surgery, transverse incision in abdominal surgery of, [Trimpi] 2307—ab
  tumors, lipomas, [Henderson] 131—ab
  tumors, polyposis, Brazil, 2168
  tumors, polyps and malignancy, Brazil, 430
COLOR
  coloring of semen, cause, 2207
  evaluation of newborn infant, [Apgar & others] *1985
  index, normal, United Kingdom, 2048
COLPOSCOPY
  observations of ectocervix of pregnancy, [Lang] 457—ab
COLUMBIA UNIVERSITY
  Institute of Nutrition Sciences, new advisory board of, N. Y., 2030
COMA: See Diabetes Mellitus; Liver
COMMISSION ON MEDICAL CARE PLANS: See American Medical Association
COMMISSUROTOMY: See Mitral Valve
[illegible] dietary ther-
[illegible]
[illegible] n Korean children, 70; 2150
  is paralysis agitans? 1594
COMMUNITY
  Alabama medical rating survey, (Council survey) 1378
  Health Council questionnaire for practicing physicians, [Babow & others] *268
  rated in Alabama physician placement survey, [Medicine at Work] 777
  rehabilitation services more practical than a center, [Medicine at Work] 1368
  trials of BCG vaccination, [Palmer] 355—ab
COMPAZINE: See Prochlorperazine
COMPETETIVE ATHLETICS: See Athletics
COMPOCILLIN V: See Phenoxymethyl Penicillin
COMPOUNDS (listed by number)
  E-39, [Brunschwig] 964—ab
  BZ 55 (carbutamide): See Sulfonylureas
  D-860 (tolbutamide): See Sulfonylureas
  2043-U (tolbutamide): See Sulfonylureas
  6782, France, 209
  6987-U (carbutamide): See Sulfonylureas
  11,925 C, Brazil, 1254
  11,925 and 11,925C, India, 803; 1680
  189c56, [Locket] 1582—ab
COMPRESSION
  in arthrodesis, compare methods of fusion of knee, [Stewart] 328—ab
CONFERENCE: See also list of Societies and other Organizations at end of letter S
  calls for medical society action in aging, [Medicine at Work] 769; 779—E
  on aging, letter from Dr. Blasingame to U. S. Senate regarding, 695
  Trans-Atlantic, annual report of Council on Scientific Assembly, 1073
CONFIDENTIAL Communications: See Privileged Communications
CONGRESS: See also list of Societies and Other Organizations at end of letter S
  Japan Medical, Ralph Creer to organize and direct International Medical Film Exhibition, 695
CONIZATION: See Uterus cervix
CONJUNCTIVITIS
  allergic, percentage of epinephrine absorbed systematically from eye? 1832
  incidence following silver nitrate and oxytetracycline in newborn eyes, [Mathieu] 121—ab
CONLEY, YVONNE, wanted by F.B.I., (photo) 1384
CONN'S SYNDROME: See Aldosteronism
CONSANGUINITY
  marriage and heredity in second generation, (replies) [Roderick; and original consultant] 363; 364
CONSENT, annual report of Law Department on, 1045
CONSTIPATION: See Cathartics
CONSTRUCTION projects, guide for medical services for, (Council guide) 1901
CONSULTATION
  rehabilitation, recommend A. M. A. approve project and urge its implementation, action on, 56
  with interested sections in special publications of A. M. A., resolution on, 71
CONTRACEPTION
  cytometer chamber spermatocidal test, [Berberian & Slighter] *2257
  Japan, 806
CONTRACTURE
  Dupuytren's, special reference to pathology, [Larsen] 966—ab
CONVULSIONS: See also Eclampsia; Epilepsy
  effect of prolonged administration of anticonvulsant drugs, India, 1798
  signs and symptoms in chronic renal failure, [Effersøe] 214—ab
  treatment, primidone: intoxication from, [Plaa & others] *1769
  treatment, resection of temporal lobe, [French] 334—ab
COOLEY'S Anemia; Trait: See Leptocytosis
COPPER
  biliary excretion before and after intravenous copper in chronic liver disease, [Bertolini] 840—ab
CORNEA
  complications of chloroquine phosphate therapy, [Zeller & Deering] *2263
  opacities, dissolving, in woman 79 with diabetes, 138; (reply) [Mann] 1838
CORONER SYSTEM
  Medical Examiner System and, annual report, 1046
CORPORA CAVERNOSA
  induration, treatment, 1955
CORTEF; CORTRIL: See Hydrocortisone
CORTICOSTEROID HORMONES
  adrenal hypofunction after withdrawal, [Vermeulen] 1406—ab
  effects on course of miliary tuberculosis, [Nitschke] 2193—ab
  effects on hepatic glycogenesis, [Fodden] 969—ab
  effects on radioactive iodine test, 1734
  in pathogenesis of congestive decompensation, [di Perri] 975—ab
  preoperative and postoperative therapy of hypophyseal adenomas and craniopharyngiomas, [Decourt] 454—ab
  symposium-panel discussion on use and abuse of, program, (A. M. A. symposium) 41
  toxicity, gastrointestinal, [McHardy] *1868
  treatment of adrenal disorders, (Council report) [Thorn & others] *2130
  treatment of spinal form of hereditary sclerosis? 1957
  treatment of thrombopenic purpura after mumps, [Kolars & Spink] *2213
  treatment of tuberculous meningitis, (India) 1392; [Dieckmann] 1580—ab
  treatment (prolonged) and antibiotics, 131
  treatment (prolonged intermittent) in nephrosis in children and adults, [Lange & others] *377
CORTICOTROPIN (ACTH)
  action in asthma, 1836
  effects in mumps meningoencephalitis, [Spitznagel] 827—ab
  producing tumor of pituitary, [Nelson] 1158—ab
  treatment (emergency) of corrosive esophagitis, France, 1255
  treatment of adrenal disorders, (Council report) [Thorn & others] *2130
  treatment of spinal form of hereditary sclerosis? 1957
  treatment (prolonged intermittent) in nephrosis in children and adults, [Lange & others] *377
CORTISONE
  as cover for major surgery in advanced pulmonary tuberculosis, [Edge] 2185—ab
  Delta—: See Prednisone
  effects in mumps meningoencephalitis, [Spitznagel] 827—ab
  Hydro—: See Hydrocortisone
  treatment (emergency) of corrosive esophagitis, France, 1255
  treatment in staphylococcic pneumonia in infants and young children, [Bühler] 222—ab
  treatment, massive doses in hepatic coma, [Pessar] 324—ab
  treatment of malignant hemoblastoses, Austria, 1922
  treatment of rheumatism, Sweden, 1394
  treatment of sarcoidosis of spinal cord, [Moldover] 2182—ab
CORTOGEN; CORTONE: See Cortisone
CORYNEBACTERIUM
  diphtheriae, toxigenicity of, India, 93
COSMETICS
  A. M. A. Committee on, annual report, 1062
COTINAZIN: See Isoniazid
COUGH
  solitary pleural effusion due to myxedema with, [Schneierson & Katz] *1003
  syncopy, Denmark, 1924
COUMADIN: See Warfarin Sodium
COUNSELING
  outpatient pastoral, in medical center, [Young & Patrick] *24
COXSACKIE VIRUS
  B virus infection, virus in blood, urine, and cerebrospinal fluid, [Utz & Shelokov] *264
  groups A and B, acute benign pericarditis with, [Movitt] 106—ab
  infection, Canada, 1922
  infection, serious, in infants and children: myocarditis, meningoencephalitis, and hepatitis, [Hosier] 1941—ab
  pneumonia, possibility of infection by pigs, [Verlinde] 1825—ab
COYOTE, rabies in, Mich., 909
CRANIOPHARYNGIOMA
  improve surgical treatment by preoperative and postoperative adrenocortical hormones, [Decourt] 454—ab
CRANIUM
  internal carotid thrombosis simulating intracranial space-occupying lesion, [Clarke] 117—ab
  [illegible] aneurysms, effects [illegible] em, [Höök] 335—ab
  [illegible] after tuberculous [illegible], [Lorber] 938—ab
  intracranial venous thrombosis in puerperium, [dalle Ore] 956—ab
  trauma, control extradural hemorrhage after, New Zealand, 95
CREEPING Eruption: See Larva Migrans
CREIGHTON UNIVERSITY SCHOOL OF MEDICINE
  training in rehabilitation, 419
CRETINISM
  early diagnostic criteria, [Lowrey] 1278—ab
CRIMINALS
  Broadmoor asylum for criminally insane, facts about, United Kingdom, 98
  Wanted by FBI: See Federal Bureau of Investigation
CROUP
  in infant, isolate cytopathogenic agent resembling CA virus from, [Crambletti] 461—ab
CRYING
  vagitus uterinus: cry in uterus, [Iklé] 439—ab
[illegible] Torulosis
[illegible] estes, undescended
[illegible]
  in child with adrenocortical carcinoma and excessive aldosterone production, [Jackson] 1701—ab
  surgical treatment, [Glenn] 2184—ab; (management and metabolic aspects of adrenalectomy) [Mason] 2308—ab
  treatment, current status, (Council report) [Thorn & others] *2130

- CYANOCOBALAMIN (vitamin B_{12})
  - in blood: See Blood
  - radioactive, diagnostic value of, [Pitney] 442—ab
  - tobacco amblyopia and, United Kingdom, 435
  - treatment of pernicious anemia, administration and dosage, 1836
  - treatment of pernicious anemia, intrinsic-factor-inhibitor in serum after, [Schwartz] 943—ab
  - treatment plus intrinsic factor in Biermer's disease, [Croizat] 1580—ab
- CYCLAMYCIN: See Triacetyloleandomycin
- CYCLOPROPANE
  - anesthesia, manual and mechanical control of *ventilation during*, [Wester & others] *2249
- CYCLOSERINE
  - treatment of tuberculosis, [Zorini] 834—ab
- CYST
  - congenital cystic dilatation of common bile duct, [Ravitch] 2310—ab
  - cystic disease of breast, treatment results, [Hendrick] 2063—ab
  - of thymus, myasthenia gravis after removal; electrolytes during crisis, [Fongi] 456—ab
  - ovarian, progesterone for, 1294
  - pancreatic pseudocyst, clinical and surgical aspects, [Waugh] 451—ab
  - pilonidal, carcinomatous degeneration, [Matt] 2311—ab
  - postpneumonic pseudo air, in children, [Schlager] 1817—ab
- CYSTADENOCARCINOMA
  - of ovary and uterine pregnancy, [Chávez] 2315—ab
- CYSTIC FIBROSIS: See Pancreas
- CYSTINOSIS
  - de Toni-Fanconi syndrome with, clinical and metabolic study of 2 cases in family, [Worthen] 121—ab
- CYSTITIS: See Bladder Inflamation
- CYTELLIN: See Sitosterols
- CYTOLOGY: See Cells
- CYTOMEGALIC INCLUSION DISEASE: See Cells
- CYTOMETER chamber spermatocidal test, [Berberian & Slighter] *2257

D

- DBED: See Benzathine Penicillin G
- *DBI: See Phenylethyldiguanide*
- DACRON, elastic, prosthesis, clinical use, [Szilagyi] 2305—ab
- DANDER
  - dog, and asthma, (replies) [Howard; and original consultant] 1170
- DANISH Medical Association, how it serves members, 1923
- DARAPRIM: See Pyrimethamine
- *DAUGHTER: See Families*
- DEAF-MUTISM
  - congenital, prolonged QT interval, syncopal attacks and sudden death, [Levine] 1818—ab
- DEAFNESS
  - bilateral, in Cogan's syndrome with cardiovascular disease, [Eisenstein] 108—ab
  - bilateral nerve, after *contrecoup* brain damage; *cause, treatment*, 2081
  - etiology: earplugs? 1958
  - etiology: intramuscular neomycin, [Körtge-Stöppler] 1285—ab
  - information for parents of young deaf children, Chicago, 294
- DEATH
  - after poliomyelitis inoculation, United Kingdom, 709
  - cause of, change of anesthetic, United Kingdom, 1927
  - cause of, penicillin toxicity, follow-up study, (reply) [Cooper] 319—C
  - cause of, pentolinium tartrate, United Kingdom, 926
  - cause of, tetanus, New Jersey, 75
  - cause of, what is? pathologist's death certificate, [Erhardt] *161; (reply) [Ziegler] 1260—C
  - causes of, Norway, 1571
  - certificates, physicians need not give, United Kingdom, 2045
  - forcible blood and fluid injection into arteries in terminal states, [Radushkevich] 1711—ab
  - of Physicians: See Physicians; list of Deaths at end of letter D
  - Rate: See Vital Statistics, mortality
  - sudden, "bangungut syndrome," in Filipinos, [Nolasco] 1403—ab
  - sudden, in congenital deaf-mutism with prolonged QT interval and syncopal attacks, [Levine] 1818—ab
  - sudden, in infancy, United Kingdom, 925
  - sudden, parathyroid crisis causes, [Hewson] 1157—ab
  - unexplained, aspiration of food and vomitus, United Kingdom, 1152
  - unexplained, from exchange transfusion, [Taylor] 340—ab
- DECOMPRESSION
  - transantral, for malignant exophthalmos, [Walker] 951—ab
- DECORTIN: See Prednisone
- DEFICIENCY DISEASE
  - encephalopathies in alcoholism, [Lapresle] 827—ab
- DEHYDROGENASE
  - succinic, in human spermatozoa, India, 94
- DELINQUENCY
  - juvenile, United Kingdom, 1153
- DELIRIUM TREMENS: See Alcoholism
- DELTA-AMINOLEVULIC ACID: See delta-Aminolevulic Acid
- DELTA CORTEF: See Prednisolone
- DELTACORTISONE; DELTASONE; DELTRA: See Prednisone
- DEMENTIA PRECOX: See Schizophrenic Reactions
- DENTISTRY
  - use of hypnosis, (Council report) 186
- DENTURES: See under Teeth
- DEODORANTS
  - relation to supply of milk in breast feeding, 1297
- DEPENDENTS' Medical Care Program: See Medicare
- DEPRESSION: See Mental Depression
- DERMATITIS
  - Atopic: See Neurodermatitis
  - Industrial: See Industrial Dermatoses
- DERMATOSIS: See Skin disease
  - Industrial: See Industrial Dermatoses
- *DESENSITIZATION: See Allergy*
- DESOXYRIBONUCLEASE
  - chymotrypsin with, to reduce sputum viscosity, United Kingdom, 2173
- DETERGENTS
  - contaminants in needles and syringes used for spinal anesthesia, effects of, [Joseph & Denson] *1330
  - subungual hemorrhage in pan washers from, [Long] *1226
- DEXTRAN
  - sulfate, alopecia due to, United Kingdom, 167:1029, June 21, 1958; (correction) 168:81, Sept. 6, 1958
- DEXTROSE: See Glucose
- DIABETES MELLITUS
  - coma in infancy, United Kingdom, 311
  - complications: dissolving corneal opacities in woman 79 with, 138; (reply) [Mann] 1838
  - complications: impotence, [Rubin & Babbott] *498
  - complications: peripheral vascular, survey of 3,600 cases, [Kramer] 2181—ab
  - complications: xanthoma, treatment, 1423
  - Diabetes Week, Nov. 16-22, 297
  - early juvenile, "insulitis" in, [LeCompte] 2199—ab
  - genetic background, 137
  - incidence in asteroid hyalitis, [Smith] *891
  - insulin-producing capacity of pancreas of children with, [Klein] 1718—ab
  - neonatal tetany in newborn babies of diabetic mothers, [Craig] 1717—ab
  - nutritional management of children with, (Council report) [Jackson] *42
  - pheochromocytoma, and glycosuria, [Freedman] 1703—ab
  - pregnancy wastage and, A. M. A. Subcommittee annual *report on*, 1060
  - restrictions in licensing pilots with, 363
  - severe, hypophysectomy in, neurosurgical aspects, [Javid] 1814—ab
  - treatment, chlorpropamide, (United Kingdom) 1574; [Murray] 2074—ab
  - treatment, DBI, nonsulfonylurea, [Krall] 835—ab
  - treatment, hypoglycemic sulfonamides, France, 803
  - treatment: phenylethyldiguanide, United Kingdom) 316; [Hall] 1286—ab
  - treatment: sulfonylureas, (Finland) 308; [Hofstetter] 1722—ab; [Ikkala] 2196—ab; (retinal hemorrhage relation to) 2208
- DIAGNOSIS
  - congestive heart failure in 46-year-old woman, (Diagnostic Problems) [Kushner & Szanto] *277
  - generalized abdominal pain and acute renal failure, (Diagnostic Problems) [Kushner & Szanto] *1778
  - hemolytic and hypochromic anemia and elevated cold agglutinins in child, (Diagnostic Problems) [Kushner & Szanto] *1013
  - hospital insurance and diagnostic services, Canada, 90
  - state-operated diagnostic center, Canada, 431
  - tissue, postmortem, transforaminal curet necropsy of brain, [MacHaffie] 1823—ab
- DIALYSIS: See Hemodialysis; Kidneys, artificial
- DIAMOX: See Acetazolamide
- DIAMTHAZOLE DIHYDROCHLORIDE
  - prednisone with, for noninflammatory scalp ringworm, [Kanof] 2318—ab
- DIAPER
  - relationship between acrodynia and mercury absorption, 138
- DIAPHRAGM
  - endometriosis, chronic recurring spontaneous pneumothorax due to, [Maurer & others] *2013
  - hepatodiaphragmatic interposition of jejunum, ileum, cecum and ascending colon with intestinal obstruction, [Aiken] 340—ab
  - injury, spontaneous pneumothorax in, found in routine laparotomies, 2083
  - ruptured, problem of, [Bernatz & others] *877
- DIARRHEA
  - in infant, neomycin-sulfadimidin for, India, 1256
  - in infants, epidemic, coliform organisms in, Canada, 1677
  - signs and symptoms in chronic renal failure, [Effersøe] 214—ab
- DIASTASE in Urine: See Urine
- DIATHERMY
  - coagulation, angiomatosis retinae 11 years after, [Vail] 2322—ab
- *DIATHESIS*
  - hemorrhagic, signs and symptoms in chronic renal failure, [Effersøe] 214—ab
- DIBENZYLINE: See Phenoxybenzamine
- DIBUCAINE
  - as spinal anesthetic, pharmacology, [Featherstone] *1327
- DICUMAROL: See Bishydroxycoumarin
- DIET
  - *American Dietetic Association and A. M. A.* sponsor committee on gastrointestinal dietary therapy, 1058
  - blood lipids and, physician himself, [McArthur] *1740
  - effect of certain oils on bile-acid secretion and serum-cholesterol, [Lewis] 131—ab
  - fat and cholesterol in, hypercholesteremia induced by, in monkeys, [Cox] 969—ab
  - for children with diabetes, (Council report) [*Jackson*] *42
  - for myopia in children, [Gardiner] 346—ab
  - high-fat, for obesity, and fatty acids, United Kingdom, 2046
  - in treatment of bleeding duodenal ulcer, [Weiss] 216—ab
  - Infant's: See Infants, feeding
  - lecithin in, can one use too much? 1168
  - low-phenylalanine, for children with phenylketonuria, [Berry] 462—ab
  - low-phenylalanine, for psychometabolic changes in phenylketonuria, [Meyer] 219—ab
  - of occupational groups, United Kingdom, 318
  - phosphorus and aluminum hydroxide in, (reply) [Farrar] 1838
  - produce experimental congenital malformations by, (Council article) [Warkany] *2020
  - protein and carbohydrate in, effects on cholesterolemia and atherogenesis in cockerels on high-fat, high-cholesterol mash, [Stamler] 976—ab
  - protein, methionine and vitamins, effects on plasma lipids and atherogenesis in cholesterol-fed cockerels, [Stamler] 976—ab
  - role of sodium in essential hypertension, [Dahl] 323—ab
  - sodium-low, physiological adaptation and clinical usefulness, (Council report) [Danowski] *1886
  - sodium restriction booklets, annual report on, 1059
- DIETHYLCARBAMAZINE
  - *treatment of tropical eosinophilia*, India, 1392
- DIETHYLSTILBESTROL
  - treatment of prostate cancer cause night *sweats and dizziness? 983*
- DIFFUSIN: See Hyaluronidase
- DIGITALIS
  - digoxin, intramuscular, experience with, [Fletcher] 437—ab
  - effect of acute digitalization in rheumatic heart disease, [Werkö] 1575—ab
  - preparations, compare six, by parenteral route, [Aravanis] 347—ab
  - treatment of myocardial infarction? 1297
- DIGOXIN: See Digitalis
- DIHYDROSTREPTOMYCIN
  - treatment plus penicillin, Sweden, 807
- 1,4-DIMETHANESULFONOXYBUTANE: See Busulfan
- DIMETHOXYBENZAL ISONICOTINYLHYDRAZONE
  - treatment of pulmonary tuberculosis, [Rubbo] 1286—ab
- DINACRIN: See Isoniazid
- 2,2-DIPHENYL-3-METHYL-4-MORPHOLINO-BUTYRYL-PYRROLIDINE
  - *after stomach surgery*, Sweden, 708
- DIPHTHERIA
  - antiserum intravenously, importance of, [Tasman] 712—ab
  - Corynebacterium, toxigenicity of, India, 93
  - diphtheritic laryngeal obstruction, prednisone *for, India, 707*
- DIRECTORS: See Executives

DIRECTORY
  American Medical Directory, (1957-1958 circulation) 1083; (20th edition available) 1232; (revision of categories) 1901
DISABILITY
  evaluation by Social Security Administration's Medical Advisory Committee, 2284
  guides to evaluation of permanent impairment of visual system, 58; 414—E; (Committee report) *475
  Industrial: See Industrial Accidents; Workmen's Compensation
  insurance program of social security, A. M. A. resolution on, 67
  service-connected, in V. A. hospitals, A. M. A. *resolution on*, 67
DISASTERS: See also Civil Defense
  emergency planning, regional variation in, [Medicine at Work] 772
  Flint tornado, management of mass casualties, [Lyttle] 1826—ab
  hospital plans for, yardstick for testing, (Council article) [Lichter & Cousin] *1131
  medical mobilization for, New York, 1383
  medical preparedness, [Hays] *254
  plan developed for metropolitan Kansas City, [Medicine at Work] 1897
DISEASE
  chronic, central information and referral services, annual report, 1108
  chronic, Greenland's invalids, Denmark, 920
  chronic, Home for Incurables affiliates with U. of Chicago, 197
  Chronic Illness Newsletter, annual report, 1103
  chronic, physician relationships, [Underwood] *1000
  chronic, 2 Minnesota societies aim at home care for, [Medicine at Work] 1894
  Iatrogenic: See Physicians
  Industrial: See Industrial Diseases
  isolation stress in, [Ziskind] *1427
  Nomenclature: See Terminology
  reviews of drug therapy, annual report on, 1056
  *systemic, oral diagnosis, [Hopp] *748*
DISINFECTION
  of water, 166:427, January 25, 1958; (correction) 168:364, Sept. 20, 1958
DISIPAL: See Orphenadrine
DISTEMPER
  measles relationship, [Adams] 354—ab
DISULFIRAM
  toxic effects, [Rathod] 2068—ab
DITUBIN: See Isoniazid
DIURESIS
  antidiuretic factor and ascites, India, 1150
DIURETICS: See also specific diuretics, as Chlorothiazide
  mercurial therapy, nephrotic syndrome complicating, [Riddle] 126—ab
  osmotic, for refractory edema, [Bernstein] 101—ab
DIURIL: See Chlorothiazide
DIVERTICULITIS; Diverticulosis: See Colon; Intestines
DIZZINESS: See Vertigo
DOCTORS: See Physicians
  Draft Law: See Medical Preparedness
DOGS
  dander and asthma, (replies) [Howard; and original consultant] 1170
DRAFT: See Medical Preparedness
DRAINAGE
  after gastrectomy, 716
  retrograde surgical, of pancreas for chronic relapsing pancreatitis, [Puestow] 217—ab
DRESSINGS
  bandage scissors, new, [Burnham] *760
  magnesium sulfate, rationale of use, (replies) [Tredici; and original consultant] 1298
DROWNING
  length of time which victim may remain submerged with hope of recovery, 1424
  treatment, France, 1255
DRUGS
  accidental poisoning, control of, [Cann & others] *717
  Addiction: See also Narcotics
  addiction to anileridine, [Therien & others] *2098
  addiction to meprobamate, [Haizlip] 337—ab; [Boyd & others] *1839
  addiction to those freely obtainable, United Kingdom, 2173
  advertising of over-the-counter medications, A. M. A.'s action on, 57
  advertising of proprietaries, (A. M. A. resolution on) 68; (annual report) 1052
  American Drug Manufacturers Association, liaison committee, annual report of A. M. A. Council on, 1073
  A. M. A. Chemical Laboratory, annual report, 1063
  A. M. A. Council on, annual report, 1056
  Army Medical Service Formulary released, 301
  contraindicated in glaucoma, 1838
  dangerous, automatic stop order on, A. M. A. *resolutions on*, 65
  evaluation of, annual report of Council, 1056
  evaluation of, factors influencing, especially *timing in hay fever, (reply)* [Engelsher] 1685—C
  F. D. A.: See Food and Drug Administration
  in shock of myocardial infarction, (Council report) [Selzer & Rytand] *762
  in vitro method to determine rate of release of delayed and sustained release medication, 1063
  means for identifying tablets or capsules, 1063
  misuse of, especially kanamycin, [Mann] 814—C
  new and nonofficial, 181; 285; 1771
DRUGS—Continued
  new and nonofficial, monographs of tests and assays published in *Drug Standards*, 41: 185; 1012
  oral medication with preparations for prolonged action, (Council report) [Dragstedt] *1652
  Prescriptions: See Prescriptions
  resistance in Shigella, Israel, 95
  therapy, reviews of, annual report on, 1056
DRUNKENNESS: See Alcoholism
DUCTUS ARTERIOSUS
  as avenue of escape in persistence of fetal ductus function after birth, [Abrams] 1280—ab
  patent, surgery for, follow 250 patients, [Helsingen] 2063—ab
DUKE UNIVERSITY
  allergy training program expanded, 420
  new biology building, N. C., 1383
  new medical education program, 1461
DUMPING SYNDROME, 1229—E
DUODENUM
  arteriomesenteric occlusion of, [Bitner] 129—ab
  cancer, diagnosis, (exfoliative cytology, rapid method of duodenal intubation) [Raskin] 440—ab; (secretin test) [Wenger] 441—ab
  Ulcer: See Peptic Ulcer
DUPUYTREN'S Contracture: See Contracture
DUST
  respiratory allergy, clinical entity in pediatrics, [Mande] 1720—ab
DWARFISM
  pituitary, diagnosis and treatment, [Martin] 957—ab
DYES
  azure A resin in tubeless gastric *analysis*, [Rosenthal & Buscaglia] *409
  gallbladder, *coronary insufficiency after oral* administration, [Littman] 352—ab
  stamp monograms on linen with, operator has muscular aches, nervousness, and retrosternal discomfort; industrial disease *aspect, 361*
DYSENTERY
  Shigella sonnei, epidemic in general hospital, [Ehrenkranz] 1726—ab
DYSMENORRHEA, 1660—E
DYSPHONIA: See Voice
DYSPLASIA
  epiphysial, multiple, [Barrie] 1269—ab
DYSTONIA
  of basal ganglions, chemopallidectomy for, [Paxton & Dow] *755
DYSTROPHY
  muscular, etiologic relation to *poliomyelitis* and head injury, treatment, 1422
  muscular, menopausal, [Kaeser] 1938—ab
  muscular, research at U. of Colorado, 1239
  reflex sympathetic, sympathetic blocks in orthopedic surgery for, [Brennan] *504

DEATHS

A

Abbissinio, Joseph J., 426
Abbott, Leigh Gates, 2285
Adams, Granville Quinn, 302
Adams, Jesse Lee Jr., 203
Adams, Warren Sanford, 2036
Adler, Ludwig, 426
Afflhauser, Robert Maurice, 426
Agnew, Lloyd Campbell, 2036
Ahroon, Carl Richard Jr., 1250
Alderman, Mason Clarence, 1916
Alexander, Horace Knox, 203
Alexander, Monroe Layfelte, 302
Alexander, Robert Mackey, 426
Allen, Greer A., 302
Allen, Samuel Shelhorn, 1793
Allen, Stephen Alex, 704
Allen, William Thomas, 704
Allum, Arthur Wesley, 203
Alston, Lucius Charles, 1793
Alter, Samuel, 1672
Ammann, Francis Xavier Jr., 83
Andersen, Silas Carl, 1916
Anderson, James Harlan, 915
Anderson, John F., 1672
Anderson, Lester D., 1916
Andes, T. Eugene, 2162
Andress, David Gustavus, 2285
Anthony, Walter E., 915
Appleton, Thomas J. Jr., 302
Aronson, Joseph David, 2036
Asbury, Charles Lowery, 302
Aszuk, Joseph Charles, 2162
Auerbach, Julius, 1566
Ausban, Henley Brown, 1250

B

Babcock, Elmer E., 1916
Bachmann, George William, 2162
B--kman, Peter Louis, 302
Bailey, Hugh Alvin, 2285
Baker, Roscoe Edward, 302
Baker, Waldo Zimmerly, 426
Baker, William Washington, 1916
Balch, Franklin Greene, 1916
Baldwin, Janet Sterling, 1566
Ballard, Robert Jackson, 2285
Banks, William Henry, 915
Barber, John Raymond, 2036
Barber, Robert Forrest, 1916
Barber, Thomas Maxfield, 915
Barker, Reuben Allen, 704
Barnes, Bruce Smith, 915
Barnes, Lewis Chesley, 2036
Barnes, Walter Steele, 302
Barnett, Jacob, 915
Barnett, John Lacy, 302
Barrett, Michael Francis, 915
Barrymore, Eugene, 915
Beckwith, Henry Witter, 915
Beede, Ralph Worthing, 915
Beisbarth, Albert, 2036
Bell, James Edgar, 915
Bell, Richard Parker Jr., 302
Bender, Alva Jacob, 1566
Bennett, Francis Wayland, 83
Bennett, Marion Horton, 1250
Benson, Harry William, 2285
Beringer, Lester Eastwood, 2036
Berman, Joseph, 2036
Bernard, Louis Emile, 2162
Bernard, Melamed Benjamin, 1793
Beyer, John Andrew II, 2162
Binter, Paul Albert, 915
Birenboim, Irvin Myron, 302
Bishop, Harry Arthur, 1916
Bishop, Vernon Leslie, 2036
Blackburn, Elisha, 2285
Blaine, Edward Smith, 2162
Blake, Wendell Phillips, 915
Blakley, Julius Warren, 1147
Bland, James Moncure, 1566
Blankenship, Marvin Winfred, 2285
Bliss, Howard Clifford, 426
Bliss, Rodney Waldo, 1387
Blodgett, George Francis, 83
Blood, Wilkie Hooper, 704
Boericke, Oscar Eugene, 2162
Bohannan, Hugh Russell, 2285
Boiarsky, Julius Lewis, 2285
Bolander, Lewis Paul, 302
Bonar, Everett Twinem, 2036
Bonnell, George Harrison, 1566
Booher, James Mathew, 1250
Boone, Henry H., 1672
Booth, Franklin H., 1916
Bosenbury, Charles Searles, 915
Bouslough, Elmer E., 2036
Bove, Anthony Daniel, 83
Bowen, Wilbur Lorenzo, 83
Bowman, James Luther, 1250
Boyd, Frank, 1916
Boyd, Lee Jackson, 302
Boyden, Guy Lee, 1387
Bradford, William Herbert, 916
Brager, Louis R., 426
Branch, Frederick Douglas, 203
Brennan, Alfred Theodore Vincent Jr., 426
Brenner, Edward Christopher, 203
Brockway, Porter Bruce, 2285
Brody, Arnold Warren, 916
Brown, Alfred, 2036
Brown, Andrew Dobbie, 426
Brown, Charles W., 1387
Brown, Joseph Nichols, 2162
Brown, Rolla Oscar, 426
Brown, William Lee Sr., 1566
Brumfiel, Daniel Milton, 916
Bruno, John Robert, 916
Buchanan, Rogers Ross, 1916
Buck, Samuel Bernice, 1387
Bullock, Norman Charles, 1566
Bunge, Charles Albert, 203
Bunker, Charles Waite Orville, 1672
Burch, Lewis J., 1147
Burch, Newnan Burgess, 2162
Burke, Joseph Peter, 2162
Burleson, William Brown, 2162
Burner, Allen Eugene, 203
Burner, Henry Clay, 1916
Burstein, Harry, 704
Burton, William Stone, 1566
Busman, George J., 916
Butler, Harry M., 2163
Butterfield, Clarence Egbert, 2285
Butz, Joseph Aaron, 203

C

Cahoon, Daniel H., 302
Calkins, Irving Romaro, 1250
Campbell, William, 2036
Carbonell, Arturo, 203
Cardinale, Pasquale F., 704
Carman, John Thomas, 2163
Carnathan, William George, 1387
Carruth, Roy Wathen, 83
Carter, Lew Arthur, 1672
Case, Frank William, 1250
Cates, Albert, 1387
Cattermole, George Stephenson, 1672
Cervone, Louisa Santoro, 426
Chalfant, Estalee Martha, 1250
Chandler, Ada B., 704
Chapman, Jeff Watson, 83
[illegible] Herbert, 1916
[illegible] 2163
[illegible] jamin, 2163
[illegible] 83
[illegible]
Christensen, Walter, 426
Cipriani, John Baptist, 2036
Clancy, Frank Jeffery, 916
Clarenbach, Julius F., 1147

Clark, Harold Chandler, 2285
Clarke, Anna Callista, 704
Claybon, Festus, 1147
Clifton, Willie Mae, 2286
Close, John Harry, 2163
Coburn, Henry Clay Jr., 2286
Cochran, Athol, 2286
Coffee, John Young Jr., 2163
Coffman, John Marvin, 1793
Coletta, John Joseph, 1673
Colleran, John Patrick, 1387
Collins, Joseph Kennard, 1673
Colmore, Rupert McPherson, 83
Combs, Victor Ray, 1673
Condon, John Joseph, 2037
Conner, Elwin Iris, 203
Conrad, Robert Waite, 426
Conway, John Michael, 1916
Conwell, John William, 1793
Cook, Byron Llewellyn, 1387
Cook, Elbert Clancy, 426
Cook, William Henry, 83
Cooley, Ben Hunter, 2286
Coover, Donald Bruce, 704
Corbin, Robert Adwood, 426
Cornell, Beaumont Sandfield, 1673
Corry, Lawrence Fitzgerald, 916
Corse, Charles A., 1147
Cosgrove, Edgar Francis, 1387
Cottrell, Asher Raymond, 83
Council, Melton Downie, 2163
Cousins, Sidney Charles, 2037
Cowles, Robert Sebastian, 1387
Cox, Charles Leon, 83
Crane, Benjamin Franklin A., 83
Creighton, Matthew Eugene, 2163
Criss, Ralph J., 1387
Critchfield, Otis D., 426
Cronin, Herbert Joseph, 2163
Crosby, Roy Campbell, 203
Crotty, Nora, 1566
Crump, John Howard, 1916
Cuff, John Reginald, 2286
Cuff, William Sherman, 1917
Cunningham, James Hay, 704
Curry, Dalferes Pennington, 427
Cutler, George David, 704

D

Dahlstrom, Arthur William, 1250
Daine, Donn David, 1147
Dakin, Robert Griffin, 83
Daley, Thomas Robert, 1250
Danell, Karl August, 704
Danforth, James Chester, 427
Daniel, Samuel Greene, 2163
Danskin, Melville, George 2163
Davidson, Walter E., 1566
Davis, James Ethelbert, 1387
Davis, James Matheson, 2163
Davis, William T., 1566
Day, Kenneth Knowlton, 1917
Deak, Alexander Paul, 1388
Decatur, Edwin Forrest, 1388
Deemar, Paul Roscoe, 1917
de Lappe, Guerne Wilson, 704
Delbaum, Harry, 2163
Dello Russo, Michael, 1147
Denman, Morris Aquila, 1673
Denniston, Frank, 704
De Pree, John Nelson Warren, 1388
de Steiguer, John Rodolph, 203
Devine, Winifred Morrill Woolls, 203
Dias, Joseph Lawrence, 1388
[illegible]
[illegible] 2163
Dodd, John Edward, 427
Dolan, Paul Egan, 704
Doll, Joseph Edwin, 1917
Donnelly, Edward John, 2037
Dorsey, George Hamilton, 203
Dougherty, Edward Francis, 2037
Downes, John Raymond, 1388
Doyle, Francis Joseph, 1388
Drake, Eugene Henry, 1917
Dreiss, Adolph Martin, 1793
Drescher, Edward Philip, 83
Drouin, Wilfred George, 1147
Dudley, Augustus William, 2163
Duffy, Joseph Benedict, 84
Duncan, B. W., 1917
Duncan, William Stevenson, 84
Dungay, Neil Stanley, 1673
Dunn, James, 2163
Durburg, John Russell, 1388
Durham, Silas Lucius, 916
Dusthimer, Oren Isaiah, 2164

E

Eagle, James Carr, 84
Ebeling, William Bruno, 2164
Edelen, James Joseph, 705
Edstrom, Henry, 203
Eilers, Paul Gerhard, 1673
Ekstrom, John E., 1250
Ekwurzel, George Macy, 204
Elder, Eugene E., 2037
Elkin, Daniel Collier, 2286
Emerson, Ralph Waldo, 84
Engelhardt, Carolina Sylvia Ruth, 1793
Englander, Charles, 84
English, Martin Joseph, 705
Eschelbacher, Leo Joachim, 84
Estabrook, Bert U., 1673
Eubanks, John Edward, 84
Evans, David Phillip, 84
Evans, William Powell, 705
Everist, Guy Vernon, 1388
Exter, Donald John, 1673
Eyestone, Fred Levi, 204

F

Falk, Alfred, 705
Faltin, Ladislaus, 916
Farrar, William Charles, 2164
Farrell, Charles Vincent, 916
Fawcett, Charles Emerson, 84
Fearrington, James Cornelius Pass, 916
Feasler, Charles Herbert, 84
Fellers, Ray Leopold, 1673
Feltenstein, David William, 916
Ferree, Arthur Cruzon, 1566
Ferrier, Paul Alexander, 303
Fessman, John William, 427
Fett, Bennie John, 427
Field, Thomas Sullivan, 2164
Fillmore, Hartson Dustin, 427
Finney, Horace Maynard, 1917
Finsterwald, Charles Frederick, 1566
Fisch, Benjamin, 427
Fischer, Morris, 84
Fischer, Oscar Gustav, 705
Fitzporter, Alonzo Leo, 2164
Flesher, George Taylor, 1147
Fliedner, Giordano Bruno, 705
Flower, Morris Aaron, 427
Flynn, Edward Anthony, 1673
Foot, Nathan Chandler, 1388
Forkin, William Patrick, 427
Forrer, Daniel Atwell, 799
Fort, Chester Arthur Jr., 1567
Fortelka, Frank Louis, 799
Foster, Wilmot Coyne, 84
Fracasse, John, 799
Freeman, Rowland Godfrey Jr., 1388
French, Oscar William, 916
French, William Joseph, 705
Frey, Jesse Jacob, 85
Frey, Robert David, 2164
Friedman, Joseph, 2164
Frisch, Felix, 85
Frymire, Ewett Waverly, 2164
Fulton, James Fairfax, 1567
Furey, Warren William, 1793

G

Gaberman, Peter, 1250
Gallagher, James Francis, 2164
Gallivan, Thomas Humphrey, 2164
Galloway, Philip Lee, 1567
Gancher, Jacob Isaac, 1673
Ganey, Joseph Matthew Sr., 1794
Gardner, Charlotte Bell, 705
Gault, Edwin Sartain, 1250
Gazzolo, Louis Joseph, 1567
Gellert, Edmund, 303
Gerwig, Henry Eugene, 1794
Gibbens, Howard Clinton, 427
Gibbons, Charles Kimball, 2164
Gibson, Stewart Merrill, 204
Gilbert, Edwin Carpenter, 1389
Gilbert, William Paul, 1567
Gilmer, Roy Jones, 1389
Girvin, Richard Bates, 1389
Glassberg, Irving Jeffery, 427
Glazer, Alfred Mirron, 1794
Gleason, Ralph Sidney, 2164
Glogowska, Jadwiga, 1917
Godschall, Alice Bush, 799
Goff, William Hunter, 1251
Goggins, John William, 1794
Goldenberg, Marcellus, 204
Goodman, Samuel, 85
Gordon, Charles Howard, 204
Gordon, Edward Johnston, 427
Goudelock, John Jefferies, 2164
Graham, Joseph Brown, 799
Graham, William Alex, 427
Grant, Hugh D., 1917
Grant, John Joseph, 1251
Grant, William Lee, 2164
Graves, John William, 1567
Gray, George Morris, 916
Gray, George Morris, 799
Gray, Robert, 1251
Gray, Robert Hollingsworth, 2164
Green, David Samuel, 1147
Greene, George A., 1251
Greenwald, Jesse, 705
Gregg, Ulysses Sherman, 1389
Gridley, Norman Grandison, 1147
Griffith, Eugene Frederick, 1147
Grove, Thomas Leon, 85
Grube, Orin Charles, 2287
Guion, Clarence Child, 1917
Gunn, William Ussery, 1567

H

Hackler, John Fielden, 1567
Haggart, Harry Humphrey, 85
Haines, Charles Tomlinson, 204
Haines, Harold Grunder, 1567
Haines, Willits Parker, 1673
Halabi, Nour Eddine, 427
Haley, Marcus Delafayette, 427
Hall, Huger Tudor, 427
Hall, James Frank, 1673
Hamilton, Charles H., 1917
Hanson, Charles Joseph, 1567
Hardenbergh, Leroy Thorne, 705
Hardesty, Henry O., 1251
Hardie, Julian Carter, 1389
Hargrove, Henry C., 2164
Harper, George Tinsley, 1917
Harper, Stephen F., 1673
Harris, Stephen Howat, 303
Haynsworth, Custis Hall, 1389
Hayward, Eugene Henderson, 427
Heath, Louanna, 428
Helbing, Harry Hugh, 85
Helland, John William, 1389
Helmholz, Henry Frederic, 799
Henry, Clyde A., 1147
Henry, John Phillips, 85
Henry, John Robert, 2164
Herbert, William, 2165
Herbst, Richard Fred, 2287
Herrington, Lee Richard Sr., 85
Herzon, Herbert, 204
Heston, Herman E., 1794
Heyroth, Francis Farnham, 1251
Hicklin, Frank E., 1147
Hicks, Harvard Raymond, 428
Higley, Charles James, 1794
Hileman, Stephen Lee, 1794
Hill, Ralph Lee, 1251
Hillenbrand, Alfred Edwin, 1794
Hilliard, Charles Wesley, 1794
Hillyer, Ernest Elwood, 85
Hindman, Sims Seward, 2287
Hitchins, Clayton Stanley, 2037
Hitt, Ashby J., 85
Hobbs, Louis Lyndon, 1917
Hochwald, Adolf, 1389
Hockenbery, Merritt L., 1147
Hoermann, Rudolph Bernhard, 800
Hogshead, J. McChesney, 85
Holland, Harry Albert, 800
Holland, Robert E. Lee, 1673
Hollingsworth, Samuel Glen, 85
Holton, Thomas Jefferson, 428
Hood, Arthur James, 1674
Hopkins, John Rolph, 85
Horton, Ray Beaman, 204
House, Lewis Clinton, 428
Houze, Harry George, 1147
Howard, Robert Warner, 1147
Howell, Asa, 1251
Hudson, Wendell Phillips, 1794
Humphrey, Wade Randall, 1147
Hurd, Annah, 1251
Hurd, Laura B., 1251
Hurrell, M. Louise, 1148
Hyder, Herman Pettibone, 428
Hydrick, John Lee, 1251

I

Iliff, Frances Jessie, 2037
Ingarra, Thomas Salvatore, 1251
Irvin, James, 800
Irwin, Henderson, 204
Isenberg, Bertice Alvin, 1917

J

Jackson, Albert F., 1674
Jackson, Chevalier, 303
Jackson, Isaiah Allen, 2287
Jackson, Richard Howard, 1794
Jacobson, Arthur Clarence, 2287
Jarrell, Columbus Marion, 1148
Jennings, Edward Allen, 1567
Jewel, Robert Theodore, 1674
Jewett, Earl Dayton, 1917
Joelson, Morris Samuel, 800
Johnson, Charles Isaac, 1794
Johnson, Frank, 2037
Johnson, Jesse Brealand, 1389
Johnson, John Franklin, 1389
Johnston, Cecil Fredrick, 204
Johnston, Edward Estill, 917
Jonas, Leon, 1794
Jones, Donald Jack, 800
Jones, Garnett, 85
Jones, Lemuel Winfield, 1674
Joseph, Cheney Cleveland, 2287
Joseph, Major Henry, 304
Joyce, Francis William, 1389
Joyce, Reid Petree, 428
Joyce, William Michael, 85
Judd, Clarence Wrigley, 1148
Juster, Vincent de Paul, 304

K

Kahlke, Charles Edwin, 1917
Kaplan, Isador, 1389
Kaplan, Murray M., 1567
Karen, Benjamin, 85
Kass, Albert Joseph, 1918
Katz, Maxwell Clarence, 917
Kauffman, Kalman L., 1251
Kavaler, Samuel, 1251
Kavle, Carleton Porter, 1251
Keating, Robert Alfred, 2287
Keating, William Bernard, 1794
Keating, William Patrick Stuart, 304
Kechele, Delbert Vine, 1794
Keiller, Violet Hannah, 1918
Kelley, Catherine Rose, 85
Kelly, William Francis, 1148
Kelso, John Calvin, 1918
Kendrick, Charles Mattox, 304
Kennedy, J. Edward T., 2287
Ketchersid, John Wesley, 2037
Key, William Frank, 1251
Kiebala, Joseph Kasmer, 1567
Killoran, Vincent Ambrose, 428
Kirk, Albert Wellington, 85
Kitlowski, Henry, 1918
Klein, Sidney, 1389
Kleiner, Blanche F., 1674
Kleinman, Samuel Bernard, 304
Kline, Ralph Glenn, 428
Klotz, Fred Guth, 2037
Knight, Durell Keeling, 800
Knope, J. Colman, 1918
Kochmann, Alfred, 1795
Konzelmann, John Bruce Hill, 304
Kun, Bertram Bela, 917
Kusnitz, Morris Jr., 1674
Kvitek, Louis Charles, 2037
Kyle, Bernard Hewitt, 1390

L

Labensky, Alfred, 85
Lacy, Justin Ernest, 1390
Lange, Horst, 86
Lassen, Fritz, 86
Lazarus, Joseph, 304
Lease, Raymond Essex, 1918
Leblicq, Fernand Joseph, 304
Lederman, Edward Isadore, 86
Leedy, Gladys June, 86
Le Golvan, Celestin, 1148
Leigh, Horace, 86
Leinoff, Harry David, 86
Leiter, H. Evans, 1795
Leith, Leroy Rhodes, 86
Lemere, Henry Bassett, 1918
Levant, Benjamin, 204
Levin, Charles Alec, 1795
Levy, Harry Robert, 1148
Lewis, Robert, 1148
Lilly, Edward, 1148
Lineberry, E. Dice, 1795
Lipschutz, Sigmund W., 2037
Lockwood, Howard De Forest, 1795
Loder, Horace Boltin, 1795
Loeb, Herbert, 1674
Logan, George W., 204
Lombardo, Bartlo William, 204
Long, Samuel Clark, 428
Long, William Hunt, 1795
Loper, John C., 1795
Lo Popolo, Vincent Charles, 800
Ludwig, David Boyd, 304
Luhr, Alfred Francis, 800
Lund, Henry Joseph, 86
Lusher, Homer Virgil, 1567
Lusk, Hamilton Neal, 428
Lyle, James McCampbell, 204
Lytle, Ralph McKay, 1918

M

McAuliffe, William Joseph Jr., 1148
MacBride-Dexter, Edith, 2165
MacBride-Dexter, Martha Edith (See MacBride-Dexter, Edith)
MacBride, Martha Edith (See MacBride-Dexter, Edith)
McCandless, Orville Calnon, 1567
Maccani, William Louis, 1795
McCarthy, Daniel Joseph, 2037
McCartney, James Shearer, 1390
McClellan, George Sterling, 86
McClure, Charles Richard, 1568
McCord, Arthur Nelson, 428
McCoy, Earl Marcus, 1148
McCue, Francis Joseph, 86
McDonald, John Thomas, 1252

McGarry, Thomas Francis, 1252
McGhee, Saylor John, 917
MacGregor, Archibald E., 1795
McHugh, William James Jr., 1795
McKay, William H., 1918
McKenna, Henry Joseph, 2165
Mackey, Robert Bliss, 1252
MacKillop, Daniel 1918
McLean, Hugh Clayton, 1252
McLeod, Alexander, 1390
McMahon, Ralph James, 1674
McMeans, Joseph William, 1568
McMillan, John Ezra, 1148
McMillan, Walter Ree, 800
MacNamee, William Hiram, 304
McNealy, Raymond William, 205
McRae, Donald Hugh, 1795
McTague, William Francis, 86
Mahon, George Dixon, 800
Maier, Henry Whitefield, 304
Maldonado, Miguel Angel, 1795
Maley, Thomas Francis, 1568
Maloney, Thomas William, 86
Mammen, Goeke Henry, 1390
Manglesdorf, William F., 205
Mann, Joseph Lee, 86
Mantell, Sol R., 304
Manwaring, Ier Jay, 2287
Marasin, Theodore Louis, 1795
Marble, Ira Albertus, 205
Maroney, Frederick William, 1918
Marsh, Charles Lafayette, 1252
Martin, Albert J., 86
Martin, Charles Dyer, 2287
Martin, James Jackson, 1568
Martin, Thomas Morris, 304
Mason, Virgil Andrew, 1390
Mateer, Harry Oliver, 2165
Mathes, Sydney Bernard, 304
Mathis, William Harris, 428
May, James Robert, 305
Mayer, Willard D., 917
Mayfield, George Franklin, 800
Mayfield, Hugh F., 800
Mechling, George Seanor, 1390
Meddis, Victor Newcomb, 1674
Meehan, Patrick Joseph, 917
Meek, Charles Roscoe, 800
Meeker, D. Olan, 1795
Mellin, L. Robert, 428
Mendelsohn, Sidney Norman, 2165
Menger, Louis Charles, 917
Mentzer, John F., 1252
Meriwether, Ellyson Gwynne, 2165
Merrill, Ralph Edward, 1390
Merritt, Francis Elmer, 205
Mertz, Albert Adolph, 917
Metheny, Samuel, 2165
Meyer, Joseph Theodore, 205
Michaelis, Lucia, 1252
Miller, Luther Edwin, 1919
Milloy, Frank Joseph, 801
Mills, Harry Lee, 1796
Milos, James Leopold, 86
Minchew, Benjamin Harvey, 1796
Minkoff, Max, 1796
Mintz, Maurice Emanuel, 1568
Mockett, Percy Charles, 917
Moffitt, John Alfred, 1796
Monk, Louis, 1252
Montgomery, Claude William, 205
Moore, Benjamin B., 205
Moore, Dan Miller, 305
Moore, M. Elizabeth, 428
Moore, William Bain, 1796
Moran, William Grayson, 1148
Morris, Benjamin Franklin, 1252
Morris, Charles David, 305
Morris, Elliston Joseph, 1252
Morris, Hurston H., 1390
Morris, James Benjamin, 428
Morris, J. F., 428
Morse, George, 1919
Morsman, Charles Frank, 1796
Moser, William Calvert, 1148
Moulton, John Henry, 1148
Muhly, Edward George, 2038
Mulford, Henry Jones, 305
Mull, Joseph Harry, 1919
Muller, Lula Johnson Power, 1252
Munch, Clarence J., 428
Munch, Louise Lucy, 1390
Mundhenk, Herbert Conner, 917
Munoz, Roque Narciso Alfonso, 1390
Munson, Alban Elliott, 1674
Murdoch, James Wilson, 1568
Murphy, Dennis John, 205
Murphy, Leonard J., 1252
Murphy, Simon William, 1390
Murray, John Watts, 1148
Myer, Edward Herman, 1390
Myers, Roy Everett, 1568

N

Neilson, Charles Hugh, 917
Nelson, Cedric Henry, 1252
Neritt, Orme Richardson, 1568
New, James Legrand, 1148
Newman, Frederick Jacob, 205
Newmann, Theodore William, 305
Nichols, Dan O., 305
Nickel, Allen Arthur Clarence, 428
Nielsen, Edwin Bjorne, 86
Nienstedt, Elam J., 305
Nimer, Melvin Arthur, 1148
Nixon, Edwin Allen, 1674
Noble, Guy Eugene, 801
Noon, Russell Alleyne, 801
Norris, Julia Anna, 1919
Novak, Eduard, 1919
Novello, Joseph Albert, 801
Noyes, Harriett Louella, 1252
Noyes, John Russell, 2165
Nussbaum, Oscar, 2165

O

Oakes, Frederick, 205
O'Brien, Daniel Patrick, 1148
O'Connor, Clarence Joseph, 1674
O'Connor, Ralph Edward, 428
O'Dell, Harry Clay, 305
O'Keefe, Edward F., 429
Olkon, David Mortimer, 1674
Olms, Frank Albert, 1568
Onesti, Silvio Joseph, 2038
Oppenheimer, Sali, 305
Osorio, Vasco Eric Monteiro, 1390
Owens, Frank Joseph, 1674

P

Pace, William Thomas, 205
Packard, Frederic Henry, 305
Pagett, Frank Elmer, 205
Painter, Thomas Edgar, 1919
Palen, Gilbert Joseph, 1796
Palmer, Clayton Hall, 305
Parker, Charles Edward, 1919
Parker, Rupert Merrill, 1252
Pater, Joseph Louis Anthony, 1919
Patterson, Charles Luther, 1919
Peirce, Bradford Hendrick, 206
Pellegrini, Pietro, 1390
Pence, James William, 1568
Pennell, Franklin Howard, 1252
Pennell, Melvin Thomas, 86
Pentel, Louis Simon, 87
Percy, Nelson Mortimer, 1674
Perelman, Julius Samuel, 87
Perkins, Orman Clarence, 917
Perkins, Roscoe Livingstone, 87
Petersen, Arthur Berg, 1919
Phillips, Edward Milliken, 1919
Phillips, John William, 1675
Phillipsen, John Albert, 1675
Phipps, George Wilson, 801
Pitkin, Horace Collins, 305
Pittenger, Earle Alexander, 1919
Platt, Marden Henry, 2038
Plummer, John Owen, 206
Poindexter, Frank Wilmore, 87
Pomainville, Frank Xavier, 1796
Pomper, Irving, 305
Poppen, Joseph A., 1252
Potter, Henry Bertram, 1919
Potter, Marjory Janette Macpherson, 1390
Potts, Frank Tuthill, 429
Power, Lula Johnson
  (See Muller, Lula Johnson Power)
Powers, Earl Jennings, 1919
Pratt, Frederick Haven, 206
Pratt, Roscoe Wellington, 87
Predmore, Donald Ford, 1568
Prevor, Morris Aaron, 1568
Purviance, Walter, 429

Q

Quaife, Lawrence Albert, 1675
Quattlebaum, Theodore Adolphus, 1568
Quigley, James Earle, 206
Quimby, Adoniram Judson, 1149

R

Rahming, Harry Ellsworth II, 1919
Rambo, William Harold, 305
Rankin, Pressly Robinson, 206
Ransbottom, Irah James, 87
Rauch, Harvey Milton, 2165
Ray, John B., 1149
Reed, Elizabeth Bass, 305
Reed, Russel Soule, 2165
Reed, Theodore Byington, 87
Reed, Wendell Phillips, 1252
Reese, John Davies, 1919
Reeves, Alfred Edwin, 1675
Reeves, Emory West, 1253
Rehbock, Donald Jacob, 1149
Reinders, Otto W., 87
Reitz, Charles, 1568
Rhodes, Goodrich Barbour, 2038
Richardson, Lawrence Lafayette, 1149
Riley, James Horatio, 1568
Rinker, George Earnest, 1675
Rittenhouse, Jacob S., 1675
Rivers, Thurston Donnell, 206
Rockwell, John Arnold, 918
Rodenheiser, Edwin William, 1675
Rogers, Asa Holt, 429
Rohr, Joseph, 1253
Ross, Lucretius Henry, 2038
Ross, Rex Roy, 1675
Rozentals, Peteris Voldemars, 87
Rubin, Isidor Clinton, 87
Rubin, Lionel Charles, 705
Rumore, Samuel Charles, 1920
Runge, Otto Ernst, 1253
Russell, Chester, 305
Russell, Claude Vernard, 2038
Rutledge, Ralph Leyda Sr., 429

S

Saferstein, T. Harry, 429
Sako, Wallace Saburo, 206
Sanders, Leighton Albert, 2038
Sanders, Lewis Jackson, 2038
Sanders, Matthew J., 1920
Sands, Irving Jesse, 2287
Sappington, William Fulford, 1253
Sartor, Pierre, 918
Saulpaugh, Lincoln Moses, 1149
Sawyer, John Brewster, 801
Sawyer, Matthias Harvey, 2288
Schabinger, Charles, 1253
Schaller, George Jacob, 2038
Schlesinger, Louis Hertz, 305
Schmitt, Alexander Hunter, 2038
Schnaer, Carl Henry, 1569
Schwartz, William H., 1253
Schwarz, Francis Stenzrd Jr., 1569
Scott, Edwin Laurence, 2288
Scott, William Wylie, 1675
Scully, Robert Emmet, 1149
Sears, Henry Clark, 801
Seebert, Joseph Eldred, 2038
Seldon, Frank Gustav, 206
Seligman, Hans, 1675
Sell, Frederick William, 206
Sellards, Joseph Walter, 801
Seth, Raymond Ephraim, 1253
Sewell, Harry Dickey, 1569
Shahan, William Ewing, 918
Shanahan, William Henry, 206
Shane, Robert Shoemaker, 429
Shanley, Emmet Baxter, 429
Shannon, Charles Edward, 206
Shapiro, David, 1796
Shaul, Elmer Bryant, 206
Shaw, Henry Alden, 2288
Sheddan, William Joplin, 429
Sheets, Cecil Clarence, 87
Shemeley, William G. Jr., 1675
Shepard, Charles Angell, 1920
Sherer, William Walter, 1569
Shields, Robert Mansen Jr., 429
Shimer, Harry A., 918
Shirk, Paul Kuhlmann, 1569
Shoemaker, J. Donald, 1920
Shumway, John Raymond, 2288
Sicotte, Isaiah, 206
Siegel, Morton Thelman, 1920
Siegfried, Joseph Howard, 1149
Silverman, Eli, 1920
Silvert, Michael, 305
Simmons, Harold Leonard Jr., 1675
Simmons, William Arthur, 1149
Slack, Louise Wetherill, 1675
Slate, John William, 1675
Slayton, Frederic Hosea, 1253
Smith, De Witt Talmage, 2038
Smith, J. Harvey, 1920
Smith, John William Rosser, 206
Smith, L. C., 2038
Smith, Stephen Decatur, 305
Smith, Wilbur Forrest, 1920
Smith, William L., 1920
Snow, Bruce, 87
Sochacki, Alexander S., 429
Sonnenfeldt, Gertrud, 306
Soucek, Adolph, 1569
Southard, Jefferson Sherlock, 2288
Southard, Mabel Austin, 1253
Southworth, Franklin Chester Jr., 1920
Spain, A. L., 1569
Sparks, Francis Rufus, 2038
Sparks, Samuel M., 801
Speight, James Ambler, 2288
Spence, James Earle Hassard, 2038
Spencer, Harry Dee, 1920
Spratt, John Thomas, 1569
Sproc, Charles, 306
Sprunk, John Paul, 1920
Stacey, Winthrop Downing, 2038
Stack, Robert Anthony Henry, 801
Stahl, Clare William, 1569
Standard, Alphonso Perry, 1796
Stanley, J. Zeph, 1920
Stansbury, Frank R., 206
Stapleton, Harvey Burr, 2288
Stasiunas, Juozas Joseph, 2038
Stayton, Chester A. Sr., 2038
Stern, Adolph, 1149
Stevenson, Arthur P., 2039
Steves, Bert Jerome, 1676
Stomberg, Carl Winfred, 801
Stout, Henry Isaiah, 1253
Straith, Claire LeRoy, 206
Straub, Hiram Grant, 207
Strickland, Harold, 2039
Strickland, John Thomas, 207
Strode, George King, 2288
Strother, Edwin Bower, 1920
Stuck, Robert Gustavus, 2039
Sturkey, Edgar Lafayette, 2289
Sturkie, Daniel R., 306
Styles, George Wilson, 1569
Sullivan, Thomas Henry, 2289
Sunderland, Paul Ulysses, 2289
Sutton, Lyle Adin, 1676
Swank, L. Forrest, 306
Swanson, Ernest Bruce, 207
Swanson, Harry Theodore, 2039
Swartsel, Samuel Carey, 2289
Swenson, Andrew Clay, 207
Swern, Nathan, 306
Swift, Earle Reed, 801

T

Tait, Edwin Forbes, 1920
Takacs, Henry, 1921
Takos, Michael James, 1676
Talbot, Clarence Weill, 207
Talbott, Edward Melville, 918
Tannhauser, Siegfried, 918
Taylor, Frank Bashford, 2039
Taylor, Richard Francis, 2289
Tenney, William Northend, 2039
Terflinger, Fred Weston, 1569
Terry, Ernest Alden Jr., 2289
Terry, Philip Roy, 2039
Tetrault, Philias Eugene, 1676
Thomas, Francis Xavier, 1921
Thomas, Henry S., 2039
Thomas, Napoleon Roscoe, 2289
Thomason, Charles Franklin, 1676
Thomasson, William Edward, 429
Thomison, Samuel James Jr., 207
Thompson, Cleveland, 801
Thompson, John Maurice, 2039
Thompson, Joseph, 1253
Thompson, Joseph Ignatius A., 2289
Thorndike, W. T. Sherman, 2165
Tietze, Herman Christian, 1253
Tillman, Isidor R., 2166
Tracy, George Thomas, 2039
Trankle, Herbert Milo, 2039
Traywick, Asa Paul, 429
Treible, William Henry, 1569
Trice, Leroy, 207
Tronnes, Nils Laurantz, 306
Truex, Barbara Mae Binkley, 2166
Truslow, Walter, 1149
Tucker, Adam Reynold, 2289
Tucker, Augustine Washington, 2289
Tucker, Winston Harris, 306
Turner, Andrew Jackson, 1253
Turner, John Patrick, 1796

U

Underwood, Robert Alfred, 1253

V

Van Del, Dwight Tedcastle, 1149
Vandermark, Walter Elbert, 918
Van Iderstine, Reginald, 429
Vaughan, Merritt Carlton, 1253
Vaux, Norris Wistar, 918
Vehrs, George Rudolph, 918
Vining, Harriet Augusta, 1921
Virden, Charles Edgar, 2166
Vogel, Hymen Allen, 207
Voskuil, Anthony, 1921

W

Waddington, Algernon Henry, 429
Walker, Joseph Edison, 801
Walliker, Wilbur Myron, 429
Ward, John Hardin, 1149
Ware, Dudley B., 306
Warren, Alexander M., 2289
Warren, Robert Franklin, 1676
Watkins, Leo Harlan, 2289
Watts, Charles Edward, 2289
Webber, Henry Allen, 1149
Weber, Harry Matthew, 1921
Weinberger, William, 918
Weinstein, David, 87
Weinstein, Max Irving, 1253
Weitz, Franklin Mathias, 918
Welsh, Arthur Brinkley, 1569
Westrope, Gordon Robert, 1569

Whedon, Edwin Earl, 1676
Wheeler, David Riddell, 207
Wheelihan, Robert York, 207
White, John Edward, 1676
White, William Henry, 207
Whitehead, Seba L., 207
Whitely, Seals Leftwich, 2166
Wiatt, William Slaughter, 2280
Wiesenfeld, Paul Choimar, 801
Wilcox, Ernest Hatch, 918
Wilkinson, Ernest A., 207
Williams, Charles Leroy, 1676
Williams, Edwin Lacy, 1569
Williams, Frank Spalding, 429
Williams, Hiram, 1676
Williams, Napoleon Kassire, 207
Williams, Paul Sinclair, 1569
Williams, Stuart Dudley, 1676
Williamson, Gladys Richards, 1021
Williston, Thomas Augustus, 306
Willmarth, Edwin Hamilton, 2166
Willoughby, Gordon Leslie, 1921
Willson, William Herbert, 1676
Wilson, Claude, 1569
Wilson, Eva McClenahan, 2166
Wilson, George Hancock, 1921
Wilson, Marion Childress, 1921
Winchell, George D., 1676
Witherington, Albert Sidney, 420
Witherspoon, Waldorf Henderson, 30
Wittenberg, Carlton Emil, 918
Witter, Calvin Bassler, 918
Wood, William Ellege, 1253
Woodall, John L., 87
Wooden, James Leonidas, 2166
Woodman, James Brown, 87
Woolridge, John Hayes, 207
Worthing, Harry Jennings, 306
Wright, Frank Taylor, 306
Wright, John Francis, 918
Wyche, George Griffin Jr., 1921
Wyman, Harry Hastings, 429

Y

Yadkowsky, Emanuel, 1253
Young, Clifford William, 306
Young, Harry Hopple, 1252
Young, Roy Lowry, 1921
Yu, Poe-Eng, 306

Z

Zachariah, Simon R., 1569
Zanger, Carl Emil, 207
Zavisca, Joseph Albert, 1149
Ziegler, William Henry, 801
Zimmerman, Frank Dieffenbach, 2166

E

- ECHO VIRUSES
  - type 9, epidemic virus meningitis due to, [Davies] 1290—ab
  - type 9, isolation from outbreak of aseptic meningitis with rubelliform rash, [Sultanian] 132—ab
- EDTA: See Edathamil
- EAR
  - eczema and pregnancy, hormones influence? 227
  - plugs, deafness from use of? 1958
- ECLAMPSIA
  - pre-eclampsia, chlorothiazide effects on water and electrolyte excretion in, [de Alvarez & O'Lane] *2226
  - pre-eclampsia, incidence, [MacGillivray] 2069—ab
  - treatment: 21-hydroxypregnanedione sodium succinate, [Martini] 2069—ab
- ECONOMICS
  - biological false-positive serologic tests for syphilis in low socioeconomic group, [Waring & others] *2004
  - Nuffield Foundation bounty, United Kingdom, 2295
  - pediatrics in transition due to, [Wheatley] *856
- ECONOMICS, MEDICAL: See also Business Practice; National Health Service
  - aid for physicians in South Carolina, [Smith] 1684—C
  - A. M. A. action on VENDOR system of payments to physicians from public funds, 58; 1106
  - A. M. A. Bureau annual report, 1080
  - A. M. A. House decisions on fund solicitations, 2149
  - American Medical Education Foundation activities, 1475; (let us put it "over the top") 2147—E; (checks received) 2150
  - Carroll studies on costs of medical education, 1472
  - case of druggist and disappearing rental, [Medicine at Work] 1896
  - coffins, costs, and care, [Medicine at Work] 1891
  - compensation for military physicians, annual report on, 1068
  - compensations to physician in occupational medicine, [Belknap] *1847
  - cost of iron preparations, United Kingdom, 1574
  - cost of "medical" care, annual report, 1107
  - estimate costs for military care, 1662
  - estimate median student expenses per year, 1517
  - federal spending for 1959, 1452
  - general practitioners' pay dispute, fail to present to Court of Session, United Kingdom, 2172
  - meeting in Buffalo, N. Y., 1141
  - missiles or pensions, comments on V. A. program, (Miscellany) [Orr] *1686
  - National Fund for Medical Education activities, 1476
  - physician's share of public costs for indigent care, [Medicine at Work] 770
  - public relations and, Canada, 90
  - school expenditures, 1493; 1494
- ECZEMA
  - ear, and pregnancy, hormones influences? 227
  - nummular, treatment, 1296
  - vaccinatum, [Reynolds] 1716—ab
- EDATHAMIL
  - calcium-disodium for lead poisoning, [Cann & others] *717
  - calcium-disodium to dissolve corneal opacities in 79-year-old diabetic, 138; (disodium, not calcium-disodium) [Mann] 1838
- *EDEMA*
  - anasarca, polyserositis and, anomalous case of, [Rowntree & others] *411
  - cardiac, Chlotride for, [Richterich] 2194—ab
  - from insect bites, prevention, treatment, 360
  - in pregnancy, acetazolamide in, [Morra] 2070—ab
  - [illegible] evaluated for, [illegible] report) [Danowski] *1886
  - pulmonary, intractable, emergency commissurotomy in, [Wessel & Webster] *1214
  - refractory, osmotic diuretic for, [Bernstein] 104—ab
- EDEMA—Continued
  - treatment: chlorothiazide, [Michelsen] 2196—ab
- EDUCATION
  - aspects of athletics for children, [Hein] *1434
  - in motor vehicle accident prevention, [Neyhart] *2209
  - Joint Committee on Health Problems in, annual report, 1080
  - undergraduate research supported by National Science Foundation, 1668
- EDUCATION, MEDICAL
  - A. M. A. Council annual report, 1087
  - American Medical Education Foundation: See Foundations
  - Annual Congress on: See American Medical Association
  - cooperation in, annual report, 1088
  - costs of, Carroll studies on, 1472
  - 4 weeks visit to medical school at Bogota, Colombia, 1391
  - graduate, A. M. A. Council annual report on, 1091
  - graduate, annual report and directory of approved internships and residencies, requirements of examining boards in specialties, 321; 694—E
  - in U. S. and Canada, (annual report) 1090; [Medicine at Work] 1370
  - internal medicine and training of internists, (Miscellany) [Rhoads] *1398
  - international exchange, 1522; 1549—E
  - Medical Education for National Defense (MEND), joint committee on, report, 1072; 1542
  - **number, 58th annual report, Nov. 15, P. 1459**
  - pediatrics in transition, training, [Wheatley] *856; (reply) [DeBacker] 1929—C
  - plea for improved training in syphilis, [Thomas] 812—C
  - postgraduate, annual report, 1093
  - postgraduate cruise to Caribbean, 1142
  - postgraduate, tax deduction for tuition costs, A. M. A. resolution on, 69
  - Preprofessional: See Basic Sciences
  - psychiatric problems and preferences for instruction by general practitioners, [Wittson & others] *1747
  - sexology and medical students, United Kingdom, 2048
  - week, annual report of PR Department, 1051
  - World Conference on, second, *1959, 1485*
- EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES
  - A. M. A. reports on, 1090; 1524
  - "Present and Future Status of Foreign Medical School Credentials in U. S.," annual report, 1089
- EFFUSIONS: See also Pleura; Pleurisy
  - malignant, prednisone for, [Franco & others] *1645
- EJACULATION
  - *retrograde, as cause of sterility in male*, [Schellen] 1578—ab
- ELASTIC Dacron prosthesis, clinical use, [Szilagyi] 2305—ab
- ELECTIONS
  - Younging of Electorates, annual report on, 1081
- ELECTRIC
  - activity of muscles in infantile cerebrospastic paralysis, India, 92
  - clippers, sterilization of, 362
  - current, changes in skin as result of, [Winer] 2073—ab
  - stimulation during lumbar sympathectomy, effective level determined by, [Randall] 444—ab
- ELECTROCARDIOGRAM: See Heart
- ELECTROENCEPHALOGRAPHY: See Brain
- ELECTROLYTES
  - excretion in preeclampsia, influence of chlorothiazide on, [de Alvarez & O'Lane] *2226
  - inverted response after total adrenalectomy, [Llaurado] 826—ab
  - renal excretion, effect of chlorothiazide on, [Lassen] 2196—ab
  - study during myasthenic crisis after removing cystic thymus, [Fongi] 456—ab
- ELECTROMYOGRAPHY: See Muscles
- ELECTRON MICROSCOPY: See Microscopy
- ELECTRONICS
  - data processing equipment, study how it can be used in *hospitals*, Tex., 1243
- EMBOLISM
  - peripheral arterial, diagnosis, [Phelan & Young] *1299
  - pulmonary, arteriosclerosis, myocardial infarction and heart anomalies with pulmonary hypertension, (Diagnostic Problems) [Kushner & Szanto] *277
  - pulmonary, in lung surgery, [Merlo] 330—ab
  - pulmonary, management of acute venous thromboembolism to avoid, [Anlyan & others] *725
  - pulmonary, maternal death due to, by amniotic fluid, [Carone] 2314—ab
- EMERGENCY: See also Civil Defense; Disasters
  - commissurotomy in intractable pulmonary edema, [Wessel & Webster] *1214
  - medical care study, evaluate task force material in, [Medicine at Work] 773
  - national medical care plan, status report of activities of commission on, 58; 1071
  - poisoning, efficient handling, [Bidder & Sunshine] *514
  - portacaval shunt, [Mikkelsen] 949—ab
  - surgical treatment of severely bleeding duodenal ulcer, [Westland] 334—ab
  - treatment of chemical eye injuries, water in, (Council report) 47
  - treatment of corrosive esophagitis, France, 1255
- EMORY UNIVERSITY
  - chair of tuberculosis and pulmonary diseases at, new, 790
- EMOTIONS
  - problems after organic brain disease, treatment, 136; (replies) [*Paley*; and original consultant] 2086
- EMPHYSEMA
  - acute emphysematous cholecystitis, [Edinburgh] 824—ab
  - anesthetist and, [Nunn] 974—ab
  - climate and, 474
  - of aged, [Mayer] 1810—ab
  - pulmonary, hazards of therapy, [Sherman] *1866
- EMPLOYEES; Employment: See Industrial Health
- EMPYEMA
  - nontuberculous, New Zealand, 95
  - staphylococcic, [Magovern & Blades] *365
  - staphylococcus, in children, [Sia] 1412—ab
  - tuberculous, topical pyrazinamide for, [Costa] 2324—ab
- *ENCEPHALITIS*
  - epidemic, India, 1258; 1682
  - equine, field and laboratory studies, [Feemster] 1418—ab
  - etiology: Asian influenza, [Furtado] 1409—ab
  - infectious, outbreaks of, 1245
  - Japanese B, India, 434
  - uveo-encephalitic syndrome, [Reed] 1937—ab
- ENCEPHALOMYELITIS
  - myalgica epidemica resembling poliomyelitis, [Gsell] 117—ab
- *ENCEPHALOPATHY*
  - deficiency in alcoholics, [Lapresle] 827—ab
- ENDARTERECTOMY
  - for peripheral arterial insufficiency, Norway, 1152
  - for relief of impotence and Leriche syndrome, [O'Conor] 1944—ab
- ENDOCARDITIS
  - bacterial, in children with heart disease, [Cutler] 2316—ab
  - due to [illegible] prognosis, (reply) [illegible]
  - septic, [illegible] for, [Chikina] 939—ab
  - staphylococcic, ristocetin for, [Weber] *1346
- ENDOCARDIUM
  - fibroelastosis, surgical treatment, poudrage technic, [Paul] 112—ab
- ENDOCERVICITIS: See Uterus
- ENDOMETRIOSIS
  - of diaphragm, chronic recurring spontaneous pneumothorax due to, [Maurer & others] *2013
- ENDOMETRIUM
  - Cancer: See Uterus Cancer
- ENDOSCOPY
  - in diagnosis of bladder neck obstruction, [Ray & Cervantes] *395
  - in treatment of parenchymal tuberculosis, [Carabelli] 1158—ab
  - of biliary tract, Germany, 1679

ENGINEERING, sanitary, India, 1258
ENTERIC Cytopathogenic Human Orphans Virus: See ECHO Viruses
ENTERITIS; ENTEROCOLITIS: See Intestines, inflammation
ENTERTAINING
  tax deduction of expenses, [Medicine and the Law] 1555
ENURESIS: See Urination, incontinence
ENVIRONMENT
  sanitation, India, 707
ENZEON: See Chymotrypsin
ENZODASE: See Hyaluronidase
ENZYMES: See specific enzymes, as Transaminase; Trypsin; etc.
EOSINOPHILIA
  tropical, diethyl carbamazine for, India, 1392
  tropical, India, 1926
EPIDEMICS: See under specific disease, as Influenza
EPIDEMIOLOGIST
  Noah Webster, 4-cent bicentennial stamp honors, (Miscellany) [Thoms] 1804
EPIDIDYMITIS
  nonspecific, etiology, treatment, bloody seminal fluid usual accompaniment? 1833
EPILEPSY
  annulment of marriage and, United Kingdom, 135
  in children, acetazolamide for [Holowach] 955—ab
  late onset, 1,000 cases, [Sheehan] 455—ab
  minor motor; diagnosis, treatment, prognosis, [Livingston] 463—ab
  postoperative, in brain abscess, [Kerr & others] *868
  psychomotor, temporal lobectomy *effects on* mental condition in, [Alajouanine] 1410—ab
EPINEPHRINE: See also Arterenol
  absorbed systematically from eye, percentage in allergic conjunctivitis, 1832
  pharmacological activity, India, 806
EPIPHYSES
  dysplasia, multiple, [Barrie] 1269—ab
EPISIOTOMY
  midline, Brazil, 88
EQUANIL: See Meprobamate
EQUIPMENT
  biomechanical, for long-term preservation of erythrocytes, [Ketchel & others] *404
ERUCTATION
  aerophagia with, treatment, 1734
ERUPTIONS
  Creeping: See Larva Migrans
  exanthem epidemic with aseptic meningitis, [Tyrrell] 1410—ab
  Industrial: See Industrial Dermatoses
ERYTHEMA
  multiforme, acute virus respiratory infections in children and, [Hölscher] 959—ab
ERYTHREMIA: See Polycythemia
ERYTHROBLASTOMATOSIS
  medullary, hemopancytopenic, [Paniagua] 108—ab
ERYTHROBLASTOSIS, FETAL: See Hemolytic Disease of Fetus and Newborn
ERYTHROCIN: See Erythromycin
ERYTHROCYTES
  hemolytic trait in Oriental Jews, Israel, 94
  in vivo survival of glycerolized and frozen cells, [Tullis & others] *399
  long-term preservation, biomechanical equipment for, [Ketchel & others] *404
  normal color index, United Kingdom, 2048
  transfusion, packed, for liver cirrhosis, India, 1150
ERYTHRODERMA
  psoriaticum, Kaposi's sarcoma superimposed on, [Segal] 465—ab
ERYTHROMYCIN
  antibacterial activity of serum after, [Kunin] 2071—ab
  hazards of, [Herrell] *1875
  treatment plus ristocetin in staphylococcic endocarditis, [Weber] *1346
ERYTHROPLASIA OF QUEYRAT
  metastasizing, fatal, [Witham] 465—ab
ESCHERICHIA
  coli, division inhibition and filament formation of, ultraviolet light to study, [Deering] 1723—ab
  coli enteritis, [Balaban] 341—ab; (in nurslings) [Tsimbler] 342—ab
  coli strains isolated in 1957, sensitivity to antibiotics, [Tóth] 122—ab
  colisepsis as cause of icterus gravis neonatorum, [Pielage] 833—ab
ESOPHAGITIS
  as cause of upper abdominal pain, [Bernstein & others] *27
  corrosive, emergency treatment, France, 1255
  peptic, and peptic ulceration of esophagus, [Wolf] 128—ab
  reflux, with stricture, jejunal interposition operation for, [Thomas & Merendino] *1759
ESOPHAGUS
  cancer, tolazoline and lymph node biopsy in, Brazil, 2040
ESOPHAGUS—Continued
  cardiomyectomy, Heller's surgical treatment of cardiospasm, [Schmidt] 448—ab
  cytology by gauze-sponge smear technique, [Hershenson & others] *1871
  gastroesophageal mechanism, experimental studies, [Meiss] 1290-ab
  lower ring, pathology of case observed for 9 years, with autopsy, [MacMahon] 968—ab
  megaesophagus in Brazilian trypanosomiasis, 89
  peptic ulceration and peptic esophagitis, [Wolf] 128—ab
  tuberculous fistula, surgery for, [Pecora] 446—ab
  varices before and after portacaval shunts, [Evans] 129—ab
  varices, bleeding, venous shunts for, [Youngblood] 2183—ab
ESSAY CONTESTS: See Prizes
ESTROGENS: See also specific preparations
  clinical use in uterine prolapse, [Anderson] *173
  "depot," for prostate cancer, [Salsano] 1287—ab
  production correlated with clinical results in breast cancer, [Bulbrook] (after oophorectomy) 947—ab; (after adrenalectomy or hypophysectomy) 948—ab
  treatment plus androgens for degeneration of teeth? 2333
ETHICS, MEDICAL
  case of druggist and disappearing rental, [Medicine at Work] 1896
  National Interprofessional Code for Physicians and Attorneys, 166—E; [Medicine and the Law] 1663
  opinions of Judicial Council, 1555
  Principles of, opinions and interpretations of, Judicial Council annual report, 1086
ETHYL AMINOBENZOATE
  absorption of local anesthetic, [Campbell & Adriani] *873
ETHYLENEDIAMINE-TETRAACETIC ACID: See Edathamil
EXAMINATIONS
  Physical: See Physical Examination
EXANTHEMS: See Eruptions
EXECUTIVES
  dysphonia in, [Gardner] 1579—ab
  health of, United Kingdom, 1153
  health problems of directors, United Kingdom, 2048
EXERCISE
  for asthmatic children, [Scherr & Frankel] *1996
  the physician himself, [McArthur] *1740
EXHIBITS
  A. M. A. Bureau annual report, 1075
  award symposium on arthritis and rheumatism, 903
  for health exposition invited, N. Y., 2158
  on film, annual report on, 1073
  traveling, annual report on, 1073
EXOPHTHALMOS
  malignant, transantral decompression for, [Walker] 951—ab
EXPLOSIONS: See also *Atomic Energy*
  hazards of vaporized alcohol, (reply) [Kneedler] 984
EXTREMITIES
  gangrene of, after cardiac infarction and noradrenaline therapy, [Greenbaum] 125—ab
  lower, movable footrest for elevation of, [Fox] *1647
  lower, skin coverage in children, [Wynn] *154
  operations, intraosseous anesthesia in, [Okhotsky] 1825—ab
  relation between condition of limbs and capacity for work in old age, *Denmark*, 208
  Vascular disease: See Arteries; Arteriosclerosis; Blood Vessels
EYEGLASSES: See Glasses
EYES
  "blinking" *in child, cause, therapy*, 137
  carcinoma, metastatic, treatment, [Buxeda] 345—ab
  constant twitching of, cause, treatment, 982
  injuries, chemical, water in emergency treatment, (Council report) 47
  newborn, incidence of conjunctivitis after silver nitrate and oxytetracycline in, [Mathieu] 121—ab
  ocular senescence, Belgium, 2290
  ophthalmoscopic examination during pregnancy, Brazil, 706
  percentage of epinephrine absorbed systematically from, in allergic conjunctivitis, 1832
  proptosis after explosion of fluorescent tube, 1295
  safety equipment, (Council report) 47
  Toxoplasma recovery from, [Hogan] 2321—ab
  toxoplasmosis, [Hogan] 2322—ab
EYESIGHT: See Vision

F

FAIRS: See also Science fairs
  health, Bureau of Exhibits annual report on, 1075
FAITH HEALING by clergymen, United Kingdom, 2171
FALLOPIAN TUBES: See Oviducts
FAMILIES: See also Heredity; Twins
  antibiotic resistant staphylococci infections in, caused by exposure of babies in hospital nurseries, [Hurst] 1826—ab
  cyclic neutropenia in father and daughter, [Hahneman & Alt] *270
  familial congenital hyperplasia of adrenal cortex, [Birke] 2182—ab
  familial Mediterranean fever, [Heller] 821—ab
  familial thalassemia and erythremic myelosis, [Olshin] 1281—ab
  hazards of using parental blood for measles modification, (replies) [Berryhill; and original consultant] 1170
  listeriosis in mother and child, [Kranendonk] 1275—ab
  multiple cases of poliomyelitis in one family, [Scarabicchi] 827—ab
  parental brutality as etiologic factor in first-degree murder, [Duncan & others] *1755
  simultaneous occurence of moderate hemophilia and thrombopathy in one family, [van Creveld] 1812—ab
  staphylococcal infection in mothers and infants, maternal breast abscesses and antecedent neonatal sepsis, [Monro] 1275—ab
  true hermaphrodite siblings, [Milner] 467—ab
  2 cases of de Toni-Fanconi syndrome with cystinosis, [Worthen] 121—ab
FARM-CITY WEEK
  annual report on, 1051
FARMERS
  chronic silo filler's disease, [Schell] 963—ab
FAT
  body, determination, India, 2292
  dietary, and cholesterol; hypercholesteremia induced by in monkeys, [Cox] 969—ab
  high, and high-cholesterol mash, effects of dietary protein and carbohydrate on cholesterolemia and atherogenesis in cockerels on, [Stamler] 976—ab
  high in diets for obesity, and fatty acids, United Kingdom, 2046
  intake, physical activity, and *blood* coagulation, United Kingdom, 1682
  metabolism and psoriasis, relationship, 716
FATHER: See Families
FATIGUE
  treatment, France, 431
FATTY ACIDS
  high-fat diets for obesity and, United Kingdom, 2046
FEDERAL: See also United States
  Bureau of Investigation, persons wanted by, (photos) (G. E. Cole and Y. Conley), 1384; (L. Manson), 2160
  Civil Defense Administration: See Civil Defense
  Communications Commission, proceedings before, annual report of Law Department, 1044
  FDA: See Food and Drug Administration
  Legislation: See Laws and Legislation
  medical services, (A. M. A. Committee annual report) 1103; (A. M. A. conference on) 2150
FEEBLEMINDEDNESS: See Mental Deficiency; Phenylketonuria
FEES
  A. M. A. Bureau of Medical Economic Research annual report on, 1080
  bill for indigent care anyway? [Medicine at Work] 1893
  for anesthesia in hypnosis, United Kingdom, 2046
  Medicare effect on, [Robinson] **1630*
  oldsters, insurance, A. M. A. meeting, report, 2148
  physicians', *Japan*, 806
  surgeon's, when visiting surgeon operates, Canada, 431
FELLOWSHIPS
  American Cancer Society, Ill., 198
  approved, according to specialties, 561; 694—E
  arthritis, awards open, 79
  blindness *research*, 2032
  cardiovascular, at U. of Mississippi, 1240
  Donner, winners announced, 78
  educational values of USPHS *programs*, 1525
  for women, 1668
  French Nestlé Company, for study of nutrition, 78
  heart research in Central Ohio, 295
  heart research study at U. of London, W. Va., 1142
  Mannheimer Memorial Fellow at May Institute for Medical Research, *Cincinnati*, 1242
  medical neoplasia, N. Y., 794
  National Institutes of Health, *in metabolic* diseases, 1915
  National Science *Foundation*, (applications due Oct. 15) 425; 1530
  nutrition, annual report, 1058
  ophthalmology, winners, 298
  pediatric, 911; 912; 1244
  Picker (James) Foundation in radiology research, 79

FELLOWSHIPS—Continued
  postdoctoral, programs of National Academy of Sciences-National Research Council, survey, 1478
  radiological physics, 1563
  rehabilitation, Arde Bulova Memorial, created, 2033
  research in clinical nutrition, applications open, (Council announcement) 768
  respiratory diseases, 912
  surgical travel fund from U. of Minnesota, 1382
  USPHS stipends increased, 1671
  Wellcome Foundation, for travel in Europe, N. Y., 793
FENESTRATION
  tracheal, indications and contraindications for, [Mayer & others] *169
FERROUS: See Iron
FERTILITY: See Sterility
FERTILIZERS
  hazards of chromium and nickel in, 1061
FETUS
  blood loss with placenta previa, 1168
  cardiac infarction in, [Schuler] 1412—ab
  death of, anatomoclinical study, central nervous system lesions, [Chosson] 119—ab
  Erythroblastosis: See Hemolytic Disease of Fetus and Newborn
  hydramnios in diagnosis of congenital obstruction of alimentary tract; maternal and fetal factors, [Lloyd] 462—ab
  malformations, origin of; case of rare monster, [de Gennaro] 2313—ab
  maternal nutrition and, (Council article) [Hepner] *1774
  perinatal study project and exhibit, annual report, 1108
  persistence of fetal ductus function after birth, ductus arteriosus as avenue of escape, [Abrams] 1280—ab
  prenatal heart electrocardiogram, 1836; (and phonocardiogram, United Kingdom) 2295; [Bergman] 2315—ab
  progesterone for threatened abortion have adverse effect on? 473
  salvage in Rh incompatability, [Bowman] 339—ab
  vagitus uterinus: cry in uterus, [Iklé] 459—ab
FEVER
  Gumma, Japan, 1393
  mechanism of, United Kingdom, 312
  Mediterranean, familial, [Heller] 821—ab
  treatment: acetylsalicylic acid vs. salicylamide, (replies) [Woodbury] 1259—C; [Bass] 1684—C
  unidentified, Dr. Hammon on mission to Thailand to serve as consultant on, Pa., 910
  West Nile, outbreak in Israel, [Spigland] 440—ab
FIBRINOGEN
  Afibrinogenemia: See Blood fibrinogen
FIBRINOLYSIN
  treatment of thrombosis, [Sokal & others] *1314
FIBROELASTOSIS: See Endocardium
FIBROMA
  of bronchus, [Rodó] 437—ab
FIBROSARCOMA
  neurofibrosarcoma of cranial nerve origin, [Economou] 951—ab
  pulmonary, risk of developing active tuberculosis, [Chase] 2059—ab
  retroperitoneal, idiopathic; involving ureters, aorta, and vena cava, [Hackett] 1707—ab
FIBROSIS, Cystic: See Pancreas
FILARIASIS
  chronic, changes in plasma proteins and lymph proteins, India, 1798
  of scrotum, India, 1682
FILTER
  pollen, most effective type, 1593
FIRE
  fatalities from, N. C., 2159
  hazards of vaporized alcohol, (reply) [Kneedler] 984
FIRST AID
  handling of poisoning emergencies, [Bidder & Sunshine] *514
FISH: See also Shellfish
  contaminated, minamata disease caused by, United Kingdom, 1683
FISTULA
  arteriovenous, congenital coronary artery, surgery for, [Fell] 1705—ab
  fluid, persistent post-traumatic, [Calvet] 1705—ab
  intrarenal arteriovenous, with hypertensive cardiovascular disease, [Milloy] 823—ab
  traumatic aortic-right ventricular, surgical repair, [King] 114—ab
  tuberculous, of esophagus; surgery for, [Pecora] 446—ab
  tuberculous, trypsin for, [Rapoport] 1581—ab
FITNESS: See Physical Fitness
FLASH blindness and chorioretinal burns produced by atomic flash, (guest editorial) [Byrnes] 778—E
FLAXEDIL: See Gallamine Triethiodide
FLUIDS
  free tissue, in female mammary gland, occurrence and significance, [Ratzenhofer] 1276—ab
  injection, forcible, into arteries in terminal states, [Radushkevich] 1711—ab
FLUORESCENT Lighting: See Lighting
FLUORINE
  Fluoridation of Water: See Water
FLUOXYMESTERONE
  treatment of advanced breast cancer, [Kennedy] 2325—ab
FLYERS; FLYING: See Aviation
FOLIC ACID
  antagonist for choriocarcinoma and related trophoblastic tumors in women, [Hertz & others] *845; 894—E; [Li] 1416—ab
FOOD: See also specific food items, as Fish
  A. M. A., Council annual report, 1057
  aspiration, United Kingdom, 1152
  Filipinos die suddenly during sleep after heavy meal: "bangungut syndrome," [Nolasco] 1403—ab
  Infant's: See Infants, feeding
  oral bouillon feedings for surgical patient, [Benjamin] 2311—ab
  patterns, lower blood lipids by changing, [Brown & Page] *1989
  poisoning, clinical-neurologic study of botulism, [Castedo] 2303—ab
  poisoning from mayonnaise, salmonellosis outbreak in hospital, Denmark, 707
  poisoning from shellfish, (Canada) 431; [Bond] 975—ab
  poisoning, minamata disease from contaminated fish, United Kingdom, 1683
  poisoning, punch in galvanized container, Calif., 790
FOOD AND DRUG ADMINISTRATION
  A. M. A. resolution commending, 71
FOOT
  footrest, movable, for elevation of lower extremity, [Fox] *1647
  neurotrophic ulcers, [Kelly & Coventry] *388
FOOTBALL
  for 14-year-old boys, 2331
  honor, physicians nominated for, 2281
FORAND BILL
  annual reports on, 1047; 1049; 1052
  type of legislation, A. M. A. resolution opposing, 65
FOREIGN BODIES
  in kidney, needle within calyces, [Naulleau] 344—ab
  soft drink bottle in peritoneal cavity, [Hope & Thedieck] *40
FORENSIC MEDICINE: See Medical Jurisprudence
FOREST, Kyasanur, disease, India, 804
FORMALDEHYDE
  hazard in workers exposed to it, (replies) [Zavon; and original consultant] 1298
FOUNDATIONS
  Allergy Foundation of America, student awards, 298
  American Foundation for Tropical Medicine, grant to support activities of Liberian Institute, N. Y., 1241
  American Medical Education, (annual report) 1119; (activities) 1475; (put it "over the top") 2147—E; (receives checks) 2150
  American Rehabilitation, sponsors symposium on basal ganglia surgery for involuntary movements, (reply) [Krusen & Ellwood] 319—C
  Arthritis and Rheumatism, fellowships, 79
  Bailey (Mary), shop for surgical needs donated to, at Hahneman Hospital, Pa., 1789
  Barker Welfare, grants for allergy awards, 298
  Bennett (A. E.) Neuropsychiatric Research, annual award made possible by, 200
  Charitable, Educational, and Scientific Foundation of Medical Society of Wisconsin co-sponsors symposium on bone (Program) (Council article) 520
  Ciba, awards for aging research, 77
  Donner Foundation of Philadelphia, x-ray generator gifts, (Conn.) 1665; (Pa.) 1912
  Easter Seal Research, grants for bone research, 80
  Ford, grant to Bronx Hospital, N. Y., 2279
  Gairdner, first international awards in arthritis and heart disease, 2281
  Hanna Fund grant to Western Reserve U., 2157
  Hartford (John A.), grants, 1243; 1787
  Hematology Research, grants, 794
  Kellogg (W. K.), (grant to U. of Michigan for research and training in Public Health) 1240; (grant to university in Colombia) 1391; (to Chilean) 2280
  Kenny (Sister Elizabeth), (co-sponsors basal ganglia surgery symposium) [Krusen & Ellwood] 319—C; (scholarships) 1561; (moves in-patient facilities to rehabilitation institute, Detroit) 2157
  Kresge, grant to Wayne State U., 1382
  Langer (Ann) Cancer Research Foundation award, 2280
FOUNDATIONS—Continued
  Life Insurance Medical Research, heart research fellowships, W. Va., 1142
  Lovelace, first annual award, Pa., 2031
  McGregor Fund, grant to Wayne State U., 1381
  National Foundation, grants, 908; 1383
  National Foundation for Research in Cutaneous Medicine formed, 1144
  National Fund for Medical Education, (established research program) 200; (activities) 1476
  National Neurological Research; awards, 1143
  National Science, (fellowships, applications due Oct. 15) 425; (new address) 1383; (activities) 1529; (support undergraduate research) 1668
  Nuffield Foundation bounty, United Kingdom, 2295
  Nutrition Foundation, (grants) 78; (annual report on A. M. A. cooperation) 1058; (supports education, hereditary galactose disease) (Council report) [Guest] *2015
  Ontario Alcoholism Research, reports, 1679; 2291
  Pfeiffer (Gustavus and Louise) Research, grants for allergy awards, 298
  Picker (James), radiology research grants, 79; 1245
  Research Corporation, grants by, 2033
  Rockefeller, grants, 75; 1391; 1681; 1791; 2296; 2279
  Sears-Roebuck, A. M. A. cooperates on brochure on Business Side of Medical Practice, 818; 935; 1114; 1155; 1262; 1401; 1691; 1806; 1932; 2050; 2176
  Wellcome, fellowship for travel in Europe, N. Y., 793
  Whitney (Helen Hay), select first recipient of T. Duckett Jones Memorial Award, 1669
  Wolfson, new charitable foundation, United Kingdom, 312
  World Rehabilitation Fund, created fellowship in rehabilitation, 2033
FRACTURES
  activation of patient with skeletal metastatic neoplasia, [Cummings & Rosenthal] *501
  diagnosis, auscultation as important aid to, [Colwill] 116—ab
  dislocation of atlas on axis, value of early fusion of C-1, C-2, and C-3, [Alexander] 453—ab
  supracondylar, of humerus in children, complications and problems of traction treatment, [Staples] *730
FRAMBESIA: See Yaws
FRAMYCETIN
  United Kingdom, 808
FREEZING
  suspended animation, United Kingdom, 1152
FRUCTOSE
  utilization of dextrose and, India, 708
FUNDS: See Foundations
FUNGI: See also Mycosis
  mycology of mouth, (United Kingdom) 2046; (contribution to) [Fox] 2302—ab
FUNNEL CHEST: See Thorax
FUREY, WARREN W. (1898-1958)
  death of, 1793
FURUNCULOSIS
  chronic, recurrent, 842
  in miners, epidemiology of, [Ruys] 963—ab

G

GALACTOSE
  disease, hereditary, (Council report) [Guest] *2015
GALLAMINE TRIETHIODIDE
  treatment of tetanus, India, 805
GALLBLADDER
  absence, congenital, [Pines] 953—ab
  calculi, gallstone ileus, [Rijken] 953—ab
  calculi, statistics; indications for cholecystectomy, [Enderlin] 2064—ab
  disease, cholelithiasis, hiatus hernia, and diverticulosis coli, [Foster & Knutson] *257
  dye, coronary insufficiency after oral administration of, [Littman] 352—ab
  inflammation, acute emphysematous cholecystitis, [Edinburgh] 824—ab
  inflammation, acute pneumocholecystitis, [Consoni] 2065—ab
  roentgen study, oral, and liver function tests correlation, 2082
GAMMA GLOBULIN
  agammaglobulinemia and hypogammaglobulinemia, contribution to study of, [Antonucci] 444—ab
  antivaccinal, United Kingdom, 2048
  demonstrate rubella neutralizing antibody in re-evaluation of rubella problem, [Krugman] 1281—ab
  hypogammaglobulinemia and bronchiectasis, [de Meulemeester] 712—ab
GANGLION (nerve)
  basal, operations, 5-year study of 700, [Cooper] 2067—ab

GANGLION—Continued
  basal, surgery for paralysis agitans, symposium on, (reply) [Krusen & Ellwood] 319—C
  blocking agent for hypertension, new long acting, oral, [Locket] 1582—ab
GANGLIONEUROMA
  of cervical autonomic system, [Smyth] 447—ab
GANGRENE
  arterial thrombosis with, after use of promazine, [Opinsky & others] *1224
  of extremities after cardiac infarction and noradrenaline therapy, [Greenbaum] 125—ab
GARTNER DUCT
  uterine carcinoma with origin in, [Andujar] 2191—ab
GAS
  in pancreas as sign of abscess, [Agnos] 944—ab
  producing bacteria, acute pneumocholecystitis from, [Consoni] 2065—ab
  sewer, pathologic effects of exposure to over period of 2 years, 716
  tear gas exposure, treatment, 1167
GASOLINE
  fumes, urge to inhale, in boy 5, treatment, 981
GASTRECTOMY: See Peptic Ulcer; Stomach, surgery
GASTRIC: See Stomach
  Ulcer: See Peptic Ulcer
GASTRITIS: See Stomach inflammation
GASTROENTERITIS
  coliform organisms in epidemic diarrhea in infants, Canada, 1677
GASTROINTESTINAL TRACT
  cancer, calcification in, [Matthews] 332—ab
  dietary therapy committee, report on, 1058
  diseases, diagnostic value of serum transaminase, [Pryse-Davies] 443—ab
  effects of penetrating nuclear radiation, [Gerstner] *381
  effects of reserpine on, New Zealand, 432
  hazards of certain therapeutic agents, [McHardy] *1868
  hemorrhage, rare causes, diagnosis and management, [Maloney] *1604
  hemorrhage, upper massive, surgical treatment, [Cooper] 333—ab
  muscle, morphology in avitaminosis E in cystic fibrosis of pancreas, [Blanc] 2071—ab
  obstruction, congenital, hydramnios in diagnosis; maternal and fetal factors, [Lloyd] 462—ab
GAUZE
  sponge smear technique in esophageal cytology, [Hershenson & others] *1871
GEMS, [Leisure Corner] 1261
GENERAL PRACTICE
  A. M. A. Committee on Preparation for, progress reports, 56; 1087; 1484
  creation of Board on, A. M. A. resolution on, 897
  evaluating, United Kingdom, 2049
  in National Health Service, United Kingdom, 314
  psychological medicine in, United Kingdom, 1573
GENERAL PRACTITIONERS
  A. M. A. General Practitioner Award: See A. M. A.
  British, think we are making same mistakes British doctors made, (Miscellany) 931
  hospital physician changes place with, Denmark, 706
  merit awards for, United Kingdom, 98
  pay dispute, plea for presentation of case to Court of Sessions fails, United Kingdom, 2172
  psychiatric problems and preferences for instruction, [Wittson & others] *1747
GENETICS: See Heredity
GENITALS
  cancer, A. M. A. Subcommittee annual report on, 1060
  cancer, testosterone enanthate for, [Giornelli] 1583—ab
  tumors, lymphangioma in children, [Gucukdjian] 1279—ab
GENITOURINARY SYSTEM
  aspects in management of severely injured patient, [Schulte] *2094
  focus in rheumatic disorder in male, [Domelj] 342—ab
  tuberculosis, diagnosis and therapy, [Ljunggren] 1414—ab
  tuberculosis; PAS, streptomycin and isoniazid for, [Hansson] 1720—ab
  tuberculosis, United Kingdom, 925
GENTIAN VIOLET: See Methylrosaniline
GEOGRAPHY
  residence restrictions and attrition, 1511
  source of entering medical students, 1507; 1508; 1510
GERIATRICS: See Old Age
GIARDIASIS (lambliasis)
  treatment, chlorquinaldol, Brazil, 1391
von GIERKE'S DISEASE: See Glycogen storage disease
GIRLS
  precocious puberty in, and hormone excretion, [Bulbrook] 1819—ab
GLANDULAR FEVER: See also Mononucleosis, Infectious
  acquired toxoplasmosis resembling, United Kingdom, 924
GLASSES
  indicated in amblyopia ex anopsia? 1732
  misconceptions about, 1785—E
GLAUCOMA
  chronic, acetazolamide in, [de Carvalho] 344—ab
  drugs contraindicated in, 1838
GLIOBLASTOMA
  multiforme; natural history, pathology, diagnostic methods, treatment, [Frankel] 1813—ab
GLIOMA
  of optic nerves, [Dodge] 336—ab
GLOBULIN: See also Gamma Globulin; Poliomyelitis Immune Globulin
  antihemophilic, deficiency, hemorrhagic capillary disorder with, [Valberg] 2180—ab
  cholesterol complex in blood in multiple myeloma, [Schless] 128—ab
  macroglobulinemia, Waldenström's, resembling multiple myeloma, [Hampton] 821—ab
GLOBUS PALLIDUS: See Lenticular Nucleus
GLOMERULONEPHRITIS: See Nephritis
GLUCOCORTICOIDS: See Corticosteroid Hormones; and individual preparations as Cortisone
GLUCOSE
  in Blood: See Blood sugar
  utilization of levulose and, India, 708
GLUTAMIC oxalacetic aminopherase: See Transaminase
GLUTAMISOL: See Bemegride
GLYCERIN
  biochemical equipment for long-term preservation of glycerolized erythrocytes, [Ketchel & others] *404
  in vivo survival of glycerolized and frozen red blood cells, [Tullis & others] *399
GLYCERYL TRINITRATE
  new concepts of coronary heart disease, [Beck & others] *2110
  treatment of myocardial infarction? 1297
GLYCOGEN
  hepatic glycogenesis, effects of corticosteroid hormones upon, [Fodden] 969—ab
  storage disease of heart, in 5 infants, [Friedman] 221—ab
  storage disease, pituitary extract to increase growth in boy with? 1594
GLYCOSURIA
  diabetes, and pheochromocytoma, [Freedman] 1703—ab
GOITER
  simple, France, 803
GOLD
  radioactive, for ovary cancer, WHO report, 1397
GONADOTROPINS in Urine: See Urine
GONORRHEA
  acute salpingitis, prognosis and treatment, [Hedberg] 1162—ab
GOUT
  gouty arthritis and, internist's interpretation of orthopedist's experience with, [Talbott] 2302—ab
  tophaceous, chronic, surgical management, [Larmon] 954—ab
GRADUATES
  A. M. E. F. alumni appeal relations, annual report, 1120
  contributions to schools from, annual report, 1120
  Foreign: See Educational Council for Foreign Medical Graduates; Physicians, foreign medical, 1521
GRANULOCYTOPENIA
  cyclic neutropenia in father and daughter, [Hahneman & Alt] *270
  neutropenia complicating staphylococcic endocarditis treated with ristocetin, [Weber] *1346
GRANULOMA
  giant-cell, respiratory (Wegener's granulomatosis), [Walton] 1404—ab
  nonspecific granulomatous disease of stomach, [Goldgraber] 819—ab
GRANULOMATOSIS
  pathergic (Wegener's granuloma) of lung, [Hood] 944—ab
GRAY, HENRY (1825-1861)
  Gray's Anatomy, centenary celebrated, United Kingdom, 1152
GREAT BRITAIN, See also British; National Health Service; Royal
  voluntary health insurance in, surprising growth of, [Follmann] *1641
GREENLAND'S invalids, Denmark, 920
GRICE PROCEDURE: See under Arthrodesis
GRISEOFULVIN
  treatment of experimentally induced ringworm in guinea pigs, United Kingdom, 810
GROWTH
  child, statistics on, 2159
"GUIDES": See American Medical Association; Societies, Medical
GUMMA fever, Japan, 1393
GUMS
  changes in, diagnosis of systemic disease, [Hopp] *748
  pigmentation, diagnosis, 1296
GYNECOLOGY
  physiological basis for hormone therapy in female, [de Alvarez & Smith] *489
  World Congress on, Canada, 89
GYNECOMASTIA: See Breast hypertrophy

H

H-BOMB: See Hydrogen Bomb
5HIAA: See 5-Hydroxyindoleacetic Acid
HAIR
  brush, nylon, [Savill] 2319—ab
  clippers, electric, sterilization of, 362
  dressers, carbon tetrachloride poisoning in, [Warshaw] 710—C
  excessive, in adolescent girls, treatment, 983
  Loss of: See Alopecia
  thinning of, in women, cause, treatment, 137
HALLUCINATIONS
  e treatment
  "hire the handicapped—it's good business," [Medicine at Work] 1368
HANDWRITING
  changes in intoxication, (Committee report) [Bogen] 48
HAPTENE
  desensitization of Rh-negative mother with? 2207
HARELIP
  in second generation, prevent defect in third generation, 1957
HAY FEVER
  factors influencing evaluation of drugs in, especially timing, (reply) [Engelsher] 1685—C
  seasonal allergic rhinitis, incidence of complications after antihistaminic therapy compared to hyposensitization, 2208
  treatment, inhalation of negative airborne ions proposed for, 1059
HEAD
  flattening of one side in infant 11 months old, treatment, 135
  infant, transillumination, demonstrated by hydranencephaly, [Griffiths] 1713—ab
  injuries, severe, treatment, [MacIver] 2062—ab
  injury, etiologic relation of muscular dystrophy to, 1422
  injury, loss of smell after, 1423
HEADACHE
  during coitus, cause and treatment, 2081
  icy cold nose with, in healthy woman going through menopause, cause, 2084
  in contrecoup brain damage, cause, treatment, 2081
  smoking in etiology of, 1954
  spinal-tap, technique to avoid, [Brocker] *261; (correction) 913
HEAF TEST
  multiple-puncture technique for tuberculin test, 716
HEALTH
  agencies, voluntary, coöperation in raising of funds for health causes, A. M. A. resolution on, 71
  A. M. A. program for older citizens, annual report, 1101
  associations, A. M. A. meets with 10 'third party' chiefs, [Medicine at Work] 1366
  care of aged, Joint Council to Improve, formed this year, 1102
  centers, management and union, A. M. A. guides for evaluation, annual reports, 1066; 1111
  centers, union, 1958 survey of, (Council articles) 904; 1234; 1066; 1112
  community council questionnaire for practicing physicians, [Babow & others] *268
  education, A. M. A. Bureau annual report, 1076
  education in industry, Committee on, annual report, 1067
  Examination: See Physical Examination
  exhibits, annual report, 1075
  exposition, exhibits invited, N. Y., 2158
  fairs, annual report of Bureau of Exhibits on, 1075
  federal spending for 1959, 1452
  fitness, annual report on, 1078
  forum, Rochester, N. Y., adventure in public relations using television, [Townsend & Steinhausen] *1983
  forums for public in Brooklyn, 1382
  fund solicitations, A. M. A. resolution on, 2149
  groups, 5 with one aim: improve patient care, [Medicine at Work] 1894
  hazard from high-power radio stations, United Kingdom, 2174
  in Denmark, 1924

HEALTH—Continued
  Indian, meeting on, Neb., 2157
  Industrial: See Industrial Health
  Insurance: See Insurance; Medical Service plans
  Joint Committee on Health Problems in Education: See Joint Committee
  National Health Service: See National Health Service
  problems of directors, United Kingdom, 2048
  program, positive, for senior citizens, proceeding available, (Council report) 1551
  public, and clinical practice, problems related to aging and long-term illness, physician relationships, [Underwood] *1000
  public, and insurance plan, Canada, 1678
  public, aspects of aging population, WHO report, 928
  public, new department in Monroe County, N. Y., 419
  public, program for municipal research in New York City, 1667
  public, state institute of, Norway, 1572
  Rural: See Rural Communities
  service reviewed, New Zealand, 1570
  standards, Israel, 2043
  USPHS, Commissioned Officer Student Training and Extern Program, 425
  USPHS conferences for medical society committees on aging, 1102
  USPHS, educational values of grants and training awards programs, 1525
  USPHS grants, 74; 197; 199; 295; 417; 420; 701; 790; 798; 909; 911; 1139; 1140; 1239; 1240; 1241; 1249; 1381; 1384; 1557; 1560; 1671; 1911; 1915; 2028; 2157; 2279
  USPHS, home care programs, 167: 1651, July 26, 1958; (correction) 168: 81, Sept. 6, 1958
  USPHS, "Immunization Information for International Travel," new edition, 914
  USPHS, more than 9,000 grants in one year, 1249
  USPHS recommends Asian influenza vaccination for certain groups, 82; 798
  USPHS research grants awarded in July and August, 1248
  USPHS water pollution report, 2035
  workers, training, grants for, 798
  World Health Organization: See World Health Organization
HEARING
  conservation program, Michigan's, 1558
  noise: is it a health problem? [Glorig & Summerfield] *370
  screening test for school children, method, 1832
  tests in patients with degeneratio pigmentosa retinae, [Alberth] 1284—ab
  tractor noise effects on auditory sensitivity of operators, [Lierle] 1721—ab
HEART
  amyloidosis, [Mulligan] 348—ab
  Anomalies: See also Ductus Arteriosus, patent
  anomalies, high defects of atrial septum, [Lewis] 145—ab
  anomalies, syndrome of left ventricular-right atrial shunt, successful surgical repair, [Gerbode] 2187—ab
  anomalies, thrombopathies with, [Alagille] 326—ab
  anomalies with pulmonary hypertension, arteriosclerosis, pulmonary embolism, and myocardial infarction, (Diagnostic Problems) [Kushner & Szanto] *277
  arrest, acute, problems and its treatment, [Spohn] 1408—ab
  arrest during surgery or anesthesia, miniature R-wave monitor to detect, [Veling] *753
  arrest, elective, under moderate hypothermia, [Riberi] 838—ab
  arrest, problem of, [McCarthy] *2101
  Artificial: See Oxygenator-Pump
  block, complete, artificial pacemaker and myocardial electrode to control, [Weirich] 822—ab
  complications of hypertension, [Cornish] 1697—ab
  dextroversion, syndrome of, [Grant] 968—ab
  disease, chronic valvular, and brucellosis, [Peery] 1810—ab
  disease, current status of pregnant cardiac, [Kaufman] 338—ab
  disease, factors in decline of maternal mortality, [Klein & Clahr] *237
  disease in children, bacterial endocarditis in, [Cutler] 2316—ab
  disease, incidence in physicians, [McArthur] *1740
  disease, international awards in, 2281
  disease, ischemic, coronary arteriographic study in, [Thal & others] *2104
  disease, ischemic, United Kingdom, 1574
  disease, low-sodium diets in, (Council report) [Danowski] *1886
  disease, patient and physician in symptom formation, [Chambers & others] *1617
  disease, rehabilitation, [Williams] 962—ab
  disease (rheumatic), effect of acute digitalization in, [Werkö] 1575—ab
  disease (rheumatic), effect of competitive industrial activity in, [Slipyan] *147, 190—E
HEART—Continued
  disease, study in patients dying with portal cirrhosis, [Lunseth] 2180—ab
  edema, Chlotride for, [Richterich] 2191—ab
  electrocardiogram interpretation, France, 91
  electrocardiogram of infants, India, 921
  electrocardiogram, prenatal fetal, 1836; [Bergman] 2315—ab
  electrocardiogram, prolonged QT interval, syncope, and sudden death in congenital deaf-mutism, [Levine] 1818—ab
  glycogen storage disease of, in 5 infants, [Friedman] 221—ab
  in-industry conference, Chicago, 1381
  Infarction: See Myocardium
  Inflammation: See also Endocarditis; Myocarditis; Pericarditis
  inflammation (rheumatic) after commissurotomy for mitral stenosis, [Golubev] 101—ab
  insufficiency (congestive failure) in 46-year-old woman, (Diagnostic Problems) [Kushner & Szanto] *277
  insufficiency (congestive failure), reversible nephrotic syndrome with, [Burack] 2208—ab
  murmurs, precordial, during pregnancy and lactation, [Hurst] 1939—ab
  new facts about, anoxia and hypoxia, (reply) [Hyman] 1151—C
  pacemaker and intravenous isoproterenol for asystole complicating acute myocardial infarction, [Solarz & others] *2124
  percutaneous left ventricular puncture with catheterization of aorta, [Fleming] 447—ab
  perforation during catheterization and selective angiocardiography, [Escher] 1696—ab
  phonocardiography and electrocardiography of fetus, United Kingdom, 2295
  rate, evaluation of newborn infant, [Apgar & others] *1985
  research fellowships available in central Ohio, 295
  research, funds for, 298; (Calif.) 2277
  right, catheterization, India, 93
  rupture, influence of anticoagulants on occurrence of, after heart infarction, [Aarseth; Lange] 1415—ab
  Surgery: See also Aorta, Aortic Valve; Arteries, coronary; Heart, anomalies; Mitral Valve; Myocardium; Pulmonary Valve
  surgery, hemorrhage and massive transfusion, [Ulin & others] *1971
  surgery, management of aortic stenosis, [Glover & Gadboys] *229
  surgery, new concepts of coronary disease [Beck & others] *2110
  surgery, open, anesthetic problems in cardiopulmonary bypass for, [Keats] 1289—ab
  surgery, open, elective cardiac arrest using potassium citrate, [Sones] 2063—ab
  surgery, open, under extracorporeal circulation, [Dubost] 1160—ab
  surgery, research grants to U. of Colorado, 1239
  surgery, studies during immediate postoperative period after total body perfusion, [Matthews] 1708—ab
  suspended, syndrome, [Bradlow] 1809—ab
  traumatic injury, nonpenetrating, [Parmley] 1823—ab
  tumor in right atrium, successful removal under hypothermia, [Krčílková] 2062—ab
HEAT
  sterilization of local anesthetics a necessity? [Bridenbaugh & Moore] *1334
  stroke, atypical, with hypernatremia, renal failure, and potassium intoxication, [Baxter] 109—ab
HELLER REPORT
  annual report on, 1117
  Hyland Committee study, amendments to Constitution and Bylaws, 61
HELMINTHS
  acquisition by young children in lower Egypt, [Kuntz] 1282—ab
  intestinal, India 1680
  uveitis caused by, [Kessel] 345—ab
HEMANGIOENDOTHELIOMA
  of stomach, [Andreassen] 825—ab
HEMANGIOMA
  in infants and children, conservative treatment, [Blackfield] 1710—ab
HEMATOLOGY: See Blood
HEMATOMA
  extradural, neurosurgical care of severely injured patient, [Odom] *2087
  Subdural: See Meninges
HEMATURIA
  in boxers, [Kleiman] *1633
HEMOBLASTOSES: See Hemopoietic System
HEMODIALYSIS: See also Kidneys, artificial
  technique, effect and indications, [Gjørup] 1287—ab
HEMOGLOBIN
  C disease, homozygous, [Tanaka] 438—ab
  methemoglobinemia in infants, United Kingdom, 709
  oxyhemoglobin and, in bank blood, biological activity of, 135
  regeneration of, India, 920
HEMOGLOBIN—*Continued*
  Vanderbilt study of maternal and infant nutrition, (*Council article*) [*McGanity & others*] *2138
HEMOLYSIS
  trait in Oriental Jews, Israel, 91
HEMOLYTIC DISEASE OF FETUS AND NEWBORN
  ABO incompatibility and, [Valentine] 460—ab
  Canada, 1923
  frequency of, [Leikin] 958—ab
  serum transaminase activity in differential diagnosis of jaundice, [Kove & others] *860
  unexplained death from exchange transfusion in, [Taylor] 340—ab
HEMOPERICARDIUM
  anticoagulants effects on occurrence of, after heart infarction, [Aarseth; Lange] 1415—ab
HEMOPHILIA
  hemophilic syndrome, 27 cases, [Thomas] 966—ab
  hemorrhagic capillary disorder with antihemophilic globulin deficiency, [Valberg] 2180—ab
  like states in girls, [Quick] 820—ab
  moderate, and thrombopathy, simultaneous in one family, [van Creveld] 1812—ab
HEMOPOIETIC SYSTEM
  effects of penetrating nuclear radiation, [Gerstner] *381
  malignant hemoblastoses, cortisone for, Austria, 1922
HEMORRHAGE: See also specific organ or region
  capillary, with antihemophilic globulin deficiency, [Valberg] 2180—ab
  control at operation, adrenochrome monosemicarbazone for, [Calnan] 1160—ab
  control, care of patient with multiple injuries, [Aufranc] *2091
  extradural, after trauma, control of, New Zealand, 95
  factors in decline of maternal mortality, [Klein & Clahr] *237
  intracranial, diagnosis and treatment in nontraumatic cerebrovascular accidents, [Scott] 2190—ab
  intracranial, in cerebral arteriovenous anomalies, [Wood] 1272—ab
  massive transfusion and, [Ulin & others] *1971
  progesterone-induced withdrawal, test for pregnancy, [Hayden] 1272—ab
  splinter, United Kingdom, 315
  subungual, in pan washers, [Long] *1226
HEMORRHOIDS
  treatment, surgery with or without Proctocaine, India, 433
HEMOSIDEROSIS
  idiopathic pulmonary, [Espinoza] 340—ab
  idiopathic pulmonary, with hemolytic and hypochromic anemia and elevated cold agglutinins, (Diagnostic Problems) [Kushner & Szanto] *1013
  radiologic sign in, [Shanbrom & Zheutlin] *33
HEMOSTASIS
  rubber band tourniquet to preserve renal function during partial nephrectomy, [Goodwin & Thelen] *179
HEPARIN
  radioactive, synthesis and metabolism, [Eiber] 1159—ab
  units required to prevent blood coagulation, 167: 1806; Aug. 2, 1958; (correction) 168: 1670, Nov. 22, 1958
HEPATITIS, INFECTIOUS (epidemic jaundice)
  chronic, plasma-transaminase activity as index of effectiveness of cortisone in, [O'Brien] 443—ab
  Coxsackie infection in infants and children, [Hosier] 1941—ab
  etiology: transfusion, safety of liquid plasma, [Sayman & others] *1735; 1784—E
  from blood transfusion, Norway, 922
  infectious mononucleosis followed or accompanied by? 2333
  outbreak on college campus, [Clark] 132—ab
  prognosis, [Cullinan] 323—ab
  serum, France, 432
  serum; hazards of certain therapeutics, [McHardy] *1868
  serum transaminase in neonatal period, aid in differential diagnosis of, [Kove & others] *860
  viral, after iproniazid therapy, pathology, findings, [Popper] *2235
  virus, subacute hepatic necrosis and postnecrotic cirrhosis due to, [Klatskin] 1811—ab
HEPATOLENTICULAR Degeneration: See Lenticular Nucleus
HEREDITY: See also Families; Twins
  consanguinous marriage and, in second generation, (replies) [Roderick; and original consultant] 363; 364
  factor in experimental congenital malformations produced by dietary measures, (Council article) [Warkany] *2020
  genetic background for leukemia and diabetes, 137
  harelip and cleft palate in second generation, prevent defect in third generation, 1957

HEREDITY—Continued
  hereditary galactose disease, (Council report) [Guest] *2015
  hereditary optic atrophy, [Iverson] 345—ab
  in etiology of mental deficiency, 1422
  of Marfan's syndrome, importance of autopsies, [Marks & Gerson] *1450
  serum phospholipids, genetic and environmental influences, [Schaefer] 1950—ab
  smoking genotypes, United Kingdom, 212
HERMAPHRODITISM
  cloaca with non-adrenal female pseudohermaphroditism, [Sieber] 2072—ab
  true, in siblings, [Milner] 467—ab
HERNIA
  congenital, of diaphragm in newborn, [Neimeier] 1817—ab
  esophageal hiatus, otalgia with, [Malherbe] 952—ab
  hiatal, new approach for herniorrhaphy, New Zealand, 1926
  hiatus, cause paroxysmal tachycardia? 1423
  hiatus, cholelithiasis, and diverticolosis coli, association of, [Foster & Knutson] *257
  hiatus, fairly large, bitterness in mouth with, cause, treatment, 136
  hiatus, medical treatment, [Flood] 942—ab
  hiatus, symptoms similar to those of angina pectoris, (replies) [Schaus: and original consultant] 228
  inguinal, in infancy and childhoood, early surgery for, [Kiesewetter] 1711—ab
  sliding, esophageal hiatus, [Dagradi] 941—ab
HERPES
  mouth lesion prior to *menstruation, (reply)* [Houk] 844
  poliomyelitis immune globulin (human) for oral lesions, N. N. D., 183
  progenitalis, treatment, 473
HETHERINGTON, WILLIAM, left A. M. A. to accept position with Reader's Digest, 695
HETRAZAN: See Diethylcarbamazine
HEXOSAMINES in Blood: See under Blood
HIBERNATION, ARTIFICIAL: See Hypothermia, Artificial
HICCUP, postoperative, Belgium, 2290
HILL-BURTON ACT: See under Hospitals
HINCONSTARCH
  treatment of pulmonary tuberculosis, [Barry] 837—ab
HIP
  trochanteric syndrome, calcareous and noncalcareous tendonitis and bursitis, [Leonard] *175
HIPPEL'S DISEASE: See Retina, angiomatosis
HIRSCHSPRUNG'S DISEASE: See Colon, megacolon
HIRSUTISM: See Hair, excessive
HISTAMINE
  carcinogens fixed by, noncarcinogens not so fixed, France 309
HISTOPLASMOSIS
  2272—E
  mass chest survey at naval station in tropics, [Scalla] 224—ab
HOBBIES: See Physicians, avocations
HODGKIN'S DISEASE
  alcohol-induced pain in, [Braun & Shnider] *1882
  alcohol sensitivity in, [Tweeddale] 1812—ab
  France, 432
  principles of prognosis in, [Justin-Besançon] 442—ab
  prognosis, [Croizat] 942—ab
  treatment, [Moschidis] 959—ab
HOME CARE
  for chronically ill, Minnesota societies aim at, [Medicine at Work] 1894
  programs in USPHS, 167:1651, July 26, 1958; (correction) 168:81, Sept. 6, 1958
  study, organized, annual report, 1107
HOMES for aged, United Kingdom, 1395
HOMICIDE: See Murder
HORMONES
  endocrine carcinogenesis, N. Z., 210
  excretion in precocious puberty in girls, [Bulbrook] 1819—ab
  influence ear eczema during pregnancy? 227
  relation between chronic cystic mastitis and breast cancer, [Womack] 2192—ab
  sex, diagnostic meaning of calcium metabolism changes after, in mammary and prostatic cancer, [Molinatti] 1917—ab
  therapy in female, physiological basic for, [de Alvarez & Smith] *489
HORNER'S SYNDROME
  analyze 216 cases, [Giles] 1944—ab
HOSPITALS
  accident burden on, A. M. A. bulletin on, 1080
  Accreditation: See also Joint Committee on Accreditation of Hospitals
  accreditation, A. M. A. part in, resolution on, 68
  Air Force Hospitals, new, (photos) 301; 2035
  A. M. A.—A. H. A. Liaison, (Committee report) 57; (recommend that hospitals set up joint conference committees) 1233
  A. M. A. Council annual report, 1087

HOSPITALS—Continued
  approved for internships in Canada, 553
  approved residencies according to, 643
  Army Reserve, moves, N. Y., 1382
  automatic stop order on dangerous drugs, A. M. A. resolution on, 65
  bed capacities, residencies by, 527; 528
  bed capacity, internships by, 523; 524; 553
  beds authorized in V. A. facilities, statement of A. M. A. before House of Representatives regarding, 191
  beds still scarce, United Kingdom, 97
  beds, use of, Japan, 2170
  Bronx Hospital expands facilities, N. Y., 2030; 2279
  charitable, tort liability to patients, [Medicine and the Law] 788
  children in, (United Kingdom) 809; 1376—E
  Children's of District of Columbia campaign to complete new Research Center, 2277
  Children's of East Bay, ground broken for, Calif., 74
  coffins, costs, and care, [Medicine at Work] 1891
  compulsory assessments and audits by, A. M. A. resolution on, 71
  control, internships by type of, 522; 523
  control, residencies by type of, 527; 528
  data on 400,000 inpatients discharged from 6,000 hospitals, annual report, 1080
  dilemma of, nurses' working hours, United Kingdom, 808
  disaster plans, yardstick for testing, (Council article) [Lichter & Cousin] *1131
  efficiency experts to streamline, United Kingdom, 809
  emergency, for Civil Defense, Denver, 2155
  employees: corridor consultations or health maintenance? [Felton] *1854
  Firmin Desloge, 25th anniversary, Mo., 419
  general, epidemic of Shigella sonnei dysentery in, [Ehrenkranz] 1726—ab
  general, psychiatric patients in, A. M. A. resolution on, 71
  Hahneman, surgical shop donated to Mary Bailey Foundation at, Pa., 1789
  having highest autopsy rates, 524
  Hill-Burton Survey and Construction program, (recommendations regarding approved) 59; (annual reports on) 1112; 1249
  how can electronic data processing equipment be adapted for use in, Texas, 1243
  Illinois Eye and Ear Infirmary, centennial of founding, Chicago, 790
  infections, "air plates" and control of, 2329
  infections, epidemiology, serologic methods for differentiation, [Naumann] 469—ab
  insurance and diagnostic services, Canada, 90
  insurance, new, and public health, Canada, 1678
  Interns; Internships: See Interns and Internship
  isolation of patients with staphylococcus infections, 716; (replies) [Rolf; and original consultant] 2208
  Jewish Hospital of Saint Louis, research grants for, 909
  liability, annual report of Law Department, 1045
  mental, Achievement Award of American Psychiatric Association to, Neb., 2278
  mental, for Memphis Medical Center, 421
  mental, Medfield State Hospital, Mass., 2156
  mental patients in, United Kingdom, 2047
  Michael Reese, new department of experimental surgery at, Chicago, 1909
  military, estimates of costs, 1662
  Misericordia General Hospital dedicated, Bronx, N. Y., 2158
  Mount Sinai, N. Y., research in experimental pathology, 1241
  Navy, new, at Portsmouth, Va., 1671
  noise abatement in, United Kingdom, 312
  nurseries, familial staphylococcic infections caused by exposure of babies in, [Hurst] 1826—ab
  nurseries, premature, salmonellosis unaccompanied by diarrhea, [Watt] 2316—ab
  nurseries, prevent staphylococcus infections in, 2204
  nursing routine challenged, United Kingdom, 2049
  Passavant Memorial, Chicago, (new East Pavilion) 791; (grant for metabolic and renal studies) 1787
  personnel, Committee on Health Programs for, annual report, 1067
  physician in, and general practitioner change places, Denmark, 706
  physicians relation to, A. M. A. resolution on, 68
  recommends formation of committees on care *of patient*, 52
  rehabilitation service, factors to be considered in planning, [Wallace & Kottke] *2253
  Residents; Residencies: See Residents and Residencies

HOSPITALS—Continued
  Saint Elizabeth's, Washington, D. C., ne neuropharmacology research center at, 22
  St. Joseph's, grant to Poliomyelitis Respir tory and Rehabilitation Center, Neb., 11
  salmonellosis outbreak in, Denmark, 707
  service, A. M. A. Committee annual report o 1115
  spending criticized, United Kingdom, 927
  staff, restrictive effect of board certificati on medical practice, A. M. A. resolution o 65
  staphylococcal outbreaks, antibiotic-resistar in medical and surgical ward, [Barbe 945—ab
  survey programs, annual report, 1092
  tissue committee, uses and abuses of, [Henl & others] *2243
  U. S., foreign physicians training in, 1523
  U. of Michigan, services at, 909
  V. A. neuropsychiatric, proposed at Brecl ville, Ohio, 1248
  V. A., new neuropsychiatric, dedicated Topeka, Kansas, (photo) 1248
  V. A., personnel changes, 425; 1248
  V. A., service-connected disabilities A. M. A. resolution on, 67
  which for 2 years do not obtain 1/4 of co plement of interns may be disapproved training, 1088
  work study in, United Kingdom, 2172
HOUSING
  V. A. wheelchair homes, 1915
HUMAN EXPERIMENTATION
  action on Nazi camp doctor, United Kingdo 97
HUMAN FACTORS BRANCH, role of, at Force Flight Test Center, [Rowen] *119
HUMERUS
  supracondylar fractures in children, complic tions and problems of traction treatme [Staples] *730
HYALASE: See Hyaluronidase
HYALINE MEMBRANE DISEASE
  contamination of lungs by fluid of birth can studies of rabbits, [Snyder] 120—ab
  in lungs of newborn, [Brummelkamp] 12 ab
  pulmonary, pathogenesis, [Zunin] 838—ab
HYALITIS
  asteroid, incidence of diabetes and hypercholesteremia in, [Smith] *891
HYALURONIDASE
  in treatment of strongiloidiasis, (Brazil) 802; [Asfora] 1703—ab
HYAZYME: See Hyaluronidase
HYDELTRA: See *Prednisolone*
HYDRALAZINE
  treated renal hypertension in rats, disease as consequence of increased arterial pressure, [Masson] 2076—ab
  treatment (intravenous) in toxemia of late pregnancy, [Johnson] 459—ab
HYDRAMNIOS: See Polyhydramnios
HYDRANENCEPHALY: See Brain
1-HYDRAZINOPHTHALAZINE: See Hydralazine
HYDROCELE
  primary, in infancy and childhood, *pathogenesis and treatment, [McKay] 1936—ab*
HYDROCORTISATE: See Hydrocortisone
HYDROCORTOLE; HYDROCORTONE: See Hydrocortisone
HYDROCORTISONE
  intra-articular, United Kingdom, 1927
  to prevent complications of endotracheal intubation, [Hamelberg & others] *1959
  toxicity, deleterious effect of intra-articular use, [Chandler] 2302—ab
  treatment (inhalation) in asthma, [Herxheimer] 2196—ab; (also bronchitis) [Helm] 2197—ab
  treatment (local) of tuberculosis in joints and tendon sheaths, [Jørgensen] 713—ab
  treatment of asthma, United Kingdom, 1928
  treatment of trochanteric syndrome, [Leonard] *175
  treatment of tuberculous meningitis, [Cranny] 1284—ab
  treatment plus vitamin B_6 in multiple sclerosis, [Reyes Oliveros] 220—ab
HYDROGEN BOMB
  exposure and leukemia, United *Kingdom, 926*
17-HYDROXYCORTICOSTERONE: See Hydro*cortisone*
HYDROXYDIONE SODIUM SUCCINATE
  N. N. D., 285
  treatment of delirium tremens, Sweden, 1801
  treatment of eclampsia, [Martini] *2069—ab*
5-HYDROXYINDOLEACETIC ACID (5HIAA)
  in urine in functioning carcinoid, [Sauer & others] *139
HYDROXYPREGNANEDIONE Succinate, Sodium: See Hydroxydione Sodium Succinate
HYDROXYPROGESTERONE
  acetate, N.N.D., 181
  caproate for functional uterine bleeding, [Zorn] 1274—ab
5-HYDROXYTRYPTAMINE: See Serotonin

COMMITTEE
  study on Heller Report on organization of A. M. A., amendments to Constitution and Bylaws on, 61
HYPERDIASTASURIA: See Urine, diastase
HYPERLIPEMIA: See Blood lipids
HYPERNEPHROMA
  metastases in vagina and vulva, [Overbeck] 338—ab
HYPERSENSITIVITY: See Allergy
HYPERTENSION: See Blood Pressure, High
HYPERTHYROIDISM
  [Rose] 945—ab
  in children, [Hyde] 1718—ab
  in patient 70, treatment, 1835
HYPERURICEMIA: See Blood, uric acid
HYPERVENTILATION: See Respiration
HYPNOSIS
  A. M. A. Board report on, 57
  fees for anesthesia in, United Kingdom, 2046
  International Society for Clinical and Experimental Hypnosis, first annual meeting, 1115
  medical use of, (Council reports) 186; 1053
HYPNOTICS: See Sedatives
HYPOGAMMAGLOBULINEMIA: See Gamma Globulin
[illegible] old
[illegible]
[illegible]
[illegible] uction or excision
HYPOPIGMENTATION: See Pigmentation
HYPOTENSION: See Blood Pressure, low
HYPOTHERMIA, ARTIFICIAL
  in thoracic and thoracoabdominal surgery, light cooling with anesthesia in poor risk patients, [Brewer] 1588—ab
  moderate, elective cardiac arrest under, [Riberi] 839—ab
  of 2 to 12 hours, rewarming after, metabolic effects, [Fisher] 839—ab
  removal of tumor from right atrium under, [Krčílková] 2062—ab
HYPOTHYROIDISM: See also Cretinism; Myxedema
  congenital, early diagnostic criteria, [Lowrey] 1278—ab
HYPOXIA: See Oxygen deficiency

I

IATROGENIC Disease: See Physicians
IBM MACHINES
  A. M. A. annual report, 1083
ICTERUS: See Jaundice
IDENTIFICATION
  of hazardous ingredients in chemical products, draft model bill on proper labelling, 1062
  of tablets or capsules, means for, 1063
ILEITIS
  regional, and pregnancy, 2332
ILEUS: See Intestines obstruction
ILLUSTRATED FILM REVIEWS: See under Moving Pictures, Medical (Reviews)
ILLUSTRATION, medical, award for at San Francisco meeting, 903
ILOTYCIN: See Erythromycin
IMIDAZOLINES: See Tolazoline
IMMIGRANTS
  colored, United Kingdom, 2170
  Physicians: See Physicians, foreign
IMMUNIZATION
  army reduces size and frequency of booster shots, 82
  guide in industry, A. M. A. works on, [Medicine at Work] 1898
  information for international travel, 914
  mass, A. M. A. stand-by program, 1072
  schedules, adult, 2328
IMPOTENCE
  diabetes and, [Rubin & Babbott] *498
  diagnostic sign in Leriche syndrome, relief by endarterectomy, [O'Conor] 1944—ab
IMPREGNATION, Artificial: See Insemination
INCLUSION DISEASE: See Cells
INCOME TAX: See Tax
INCONTINENTIA PIGMENTI: See Pigmentation
INDIANS, AMERICAN
  meeting on health of, Neb., 2157
  service, reserve officers, A. M. A. Bylaw changes on membership for, 59
INDIGENT: See Medically Indigent
INDUSTRIAL ACCIDENTS
  chemical eye injuries, water in emergency treatment of, (Council report) 47
  revision of manual on evaluation of injuries, A. M. A. resolution on, 899
INDUSTRIAL DERMATOSES
  medicolegal aspects, (Council report) 1351
  prolonged and recurrent, (Council report) *516
  streptomycin dermatitis in nurses, [Wilson] 465—ab
INDUSTRIAL DISEASES
  A. M. A. Committee *on* Neurological Disorders in Industry, first meeting, 1066
  arsine poisoning from cleaning sulfuric acid tanks, United Kingdom, 311
INDUSTRIAL DISEASES—Continued
  bronchitis and outdoor occupations, United Kingdom, 2045
  carbon tetrachloride poisoning in hairdressers, [Warshaw] 710—C
  chronic silo filler's disease, [Schell] 963—ab
  deafness from use of earplugs? 1958
  diagnosis and proper method of reporting, [Johnstone] *1844
  furunculosis in miners, epidemiology, [Ruys] 963—ab
  hematuria in boxers, [Kleiman] *1633
  man stamps monograms on linen; muscular aches, nervousness, and retrosternal aches from dye? 361
  Pneumonoconiosis; Silicosis: See Pneumono*coniosis*
  subungual hemorrhage in pan washers, [Long] *1226
INDUSTRIAL HEALTH
  ad hoc Committee on Medical Services for Construction Projects, new, 1067; (guide) 1901
  A. M. A. Committee on Medical Care for Industrial Workers, *annual report, 1109*
  A. M. A. Council annual report, 1065
  A. M. A. Joint Committee on Mental Health in Industry, annual report, 1067
  A. M. A. works on immunization guide in industry, [Medicine at Work] 1898
  cardiac rehabilitation, [Williams] 962—ab
  Committee on Industrial Health Emergencies reactivated as Committee on Industrial Health Defense, 1065
  diets of occupational groups, United Kingdom, 318
  effect of competitive industrial activity on severely disabled cardiac patients, [Slipyan] *147; 190—E
  effect of fluorescent light on vision, (Council report) 47
  effect of tractor noise on auditory sensitivity of operators, [Lierle] 1721—*ab*
  formaldehyde hazard in workers exposed to it, (replies) [Zavon; and original consultant] 1298
  guides to evaluation of permanent impairment to visual system, 414—E; (Committee report) *475
  hazards in antibiotic factory, Denmark, 208
  health of executives, United Kingdom, 1153
  Heart-in-Industry *conference*, Chicago, 1381
  "hire the handicapped—it's good business," [Medicine at Work] 1368
  hospital employees, corridor consultations or health maintenance? [Felton] *1854
  medical considerations of exposure to microwaves, [Barron & Baraff] *1194
  medicine, compensations to physician in, [Belknap] *1847
  mobile units in, [Medicine at Work] 1898
  myocardial infarction rate by occupational group, [Biorck] 841—ab
  new concepts of coronary heart disease after surgery, [Beck & *others*] *2110
  noise: is it a health problem? [Glorig & Summerfield] *370
  old age and work, condition of limbs related to capacity for work, Denmark, 208
  physician as advisor to management, [Keene] *1851
  problem back, [Kirkpatrick] *1864
  problems of directors, United Kingdom, 2048
  silica exposure after tuberculosis, 2330
  study of men who returned to work after myocardial infarction, [Weiss & Weiss] *17
  troubled employee; economic loss, community problem, medical challenge, (Medicine at Work) [Golin] 1371; 1377—E
  workers' absenteeism due to illness and injury, preliminary guide for measuring, (Council *reports) 904; 1066; 1112; 1230*
  workers' absenteeism, medical certification for, 1019—E
  workers' absenteeism, PHS recommended influenza vaccination among certain groups, 82; 798
  workers' absenteeism, relation to private prac*tice*, abstracts on, 903; 1019—E; 1133
INDUSTRIAL HYGIENE
  eye safety equipment, (Council report) 47
INDUSTRIAL MEDICINE: See Industrial Health
INDUSTRIAL TRADE UNIONS: See also United Mine Workers *of America*
  A. M. A. guides for evaluating management and union health centers, annual report, *1066*; 1111
  A. M. A. meets with 10 "third party" medical chiefs, [Medicine at Work] 1366
  health and insurance plans under collective bargaining, summary report, 1663
  medicine meets with labor, report of conference, 289—E; 290
  1958 survey of union health centers, (Council reports) 904; 1066; 1112; 1234
  third parties in medicine; union, management, and consumer sponsored medical service plans, (President's page) 416
INFANTS
  antipyretic effectiveness and toxicity of aspirin and salicylamide in, (replies) [Woodbury] 1259—C; [Bass] 1684—C
  cold babies, United Kingdom, 97
  coliform organisms in epidemic diarrhea in, *Canada, 1677*
  Coxsackie infection serious in, [Hosier] 1941—ab
  croup in, isolate cytopathogenic agent resembling CA virus from, [Cramblett] 461—ab
  cystic kidney disease in, [Hooper] 466—ab
  diabetic coma in, United Kingdom, 311
  diarrhea in, neomycin-sulfadimidin for, India, 1256
  [illegible] dia, 921
  [illegible] of one side of head
  Escherichia coli enteritis in, [Tsimbler] 342—ab
  examination for muscle weakness in, [John*son*] *1306
  feeding, omit milk and galactose-containing food for hereditary galactose disease, (Council report) [Guest] *2015
  feeding, Vanderbilt study of maternal and infant nutrition, (Council article) [McGanity & *others*] *2138
  glycogen storage disease of heart in, [Friedman] 221—ab
  *head, transillumination, demonstrate by hydra*nencephaly, [Griffiths] 1713—ab
  hemangiomas in, conservative treatment, [Blackfield] 1710—ab
  hydroceles in, primary, pathogenesis and treatment, [McKay] 1936—ab
  inguinal hernias in, early surgery for, [Kiesewetter] 1711—*ab*
  leukemia in, due to irradiation of mother during pregnancy, United Kingdom, 314
  methemoglobinemia in, United Kingdom, 709
  Mortality: See also Fetus, death of; Stillbirth
  mortality after use of promethazine in obstetrics, [Carroll & Moir] *2218
  mortality and morbidity study, conference on, (Council report) 1554
  perforating peptic ulcer in, [Grasveld] 218—ab
  plasma-cell pneumonia in, etiology, [Moser] *1413—ab*
  pneumonia with abscess formation in, therapy, [Bucha] 222—ab
  *poliomyelitis antibodies diaplacentally trans*mitted in, persistence of, [Müller] 341—ab
  poliomyelitis antibodies in, before and after vaccination, [Buser] 220—ab
  postpneumonic lung abscess in, lobectomy for, [Moore] 2308—ab
  premature and weak, meningeal hemorrhages of, [Giraud] 1719—ab
  premature, BCG vaccination of, [Eckardt] 122—ab
  premature, kernicterus in, with low bilirubin *in plasma*, [Harris] 461—ab
  premature, relationship of Little's disease to, [Churchill] 831—ab
  premature, salmonellosis in nursery unaccompanied by diarrhea, [Watt] 2316—ab
  respiratory infections, acute, in, treatment, [Nisbet] 2317—ab
  response to poliomyelitis vaccine given during pregnancy, [Martins da Silva & others] *1
  serological response to poliomyelitis vaccine, [Perkins] 1164—ab
  staphylococcal infection in mothers and, [Monro] 1275—ab
  staphyloccic pneumonia in, [Hendren & Haggerty] *6; (cortisone for) [Bühler] 222—ab
  sudden death, United Kingdom, 925
INFANTS, NEWBORN: See also Fetus
  birth weights, optimal, New York city comments on U. S. Government study, [Baumgartner] 1154—C
  evaluation of, [Apgar & others] *1985
  Hemolytic Disease of (Erythroblastosis): See Hemolytic Disease
  hernia of diaphragm in, [Neimeier] 1817—ab
  hyaline membranes in lungs of, [Brummelkamp] 123—ab
  incidence of conjunctivitis after silver nitrate and oxytetracycline in, [Mathieu] 121—ab
  jaundice in, serum transaminase in differential diagnosis of, [Kove & others] *860
  Mortality: See Fetus, death of; Infants, mortality; Stillbirth
  mycoses of, etiology: vaginitis, [Bret] 458—ab
  narcotic withdrawal symptoms in, [Kunstadter & others] *1008
  perforation of stomach in, [Castleton] 111—ab
  perinatal study project and exhibit, annual report, 1108
  Premature: See Infants, premature
  pulmonary pathology in, [Briggs] 460—ab
  rupture of normal spleen in, during delivery; [Hottinger] 461—ab
  septicemia in, [Nyhan] 1716—ab
  tetanus in, *(Denmark) 706; (Brazil) 2167*
  tetany in, especially in babies of diabetic mothers, [Craig] 1717—ab

INFANTS, NEWBORN—Continued
  thrombocytopenia in, India, 1798
  varicella with isolation of virus in, [Ehrlich] 1277—ab
INFECTION: See also specific organ or region, as Respiratory Tract; and specific agent as Staphylococcus
  chronic, recurrent night sweats, diagnosis, treatment, 843; (replies) [Robinson; Weinberg] 2208
  control, factors in decline of maternal mortality, [Klein & Clahr] *237
  hospital, "air plates" and control of, 2329
  hospital, epidemiology, serologic methods for differentiation, [Naumann] 469—ab
  in 4 siblings, lymphoid leukemia developed in one, [Tudor] 930—C
  neonatal, and vaginitis, mycoses of newborn, [Bret] 458—ab
  septic, leukocyte sedimentation rate in, [Lusvarghi] 2200—ab
  septic shock, nature and treatment, [Altemeier] 2198—ab
  surgical, control, [Hitchcock] 2066—ab
  surgical, wound, United Kingdom, 925
  treatment, dihydrostreptomycin plus penicillin, Sweden, 807
INFERTILITY: See Sterility
INFLUENZA
  Asian, A. M. A., program, annual report on, 1051; 1071
  Asian, effects on cardiovascular system, [Walsh] 1809—ab
  Asian, encephalitis caused by, [Furtado] 1409—ab
  Asian, Far East strain, [De Maeyer] 104—ab
  Asian, (Israel) 94; (Belgium) 307; (United Kingdom) 1396; (Netherlands) 2044
  Asian, neurologic disorders after, [Horner] 118—ab; [McConkey] 954—ab
  Asian, psychosis after, Israel 2044
  Asian, pulmonary complications, eventually lethal, treatment, [Moeschlin] 1158—ab
  Asian, spontaneous pneumothorax in, [Welsh] 1698—ab
  Asian, vaccine, intradermal injection; polyneuritis after, (replies) [Steigman; and original consultant] 2086
  Asian, virus vaccine, monovalent, type A, N. N. D., 182
  complications: fulminating pneumonias, [Buechner] 105—ab
  epidemic, [Laha] 1577—ab
  epidemic, importance of Staphylococcus aureus in pneumonia in, [Robertson] 1585—ab
  epidemic in Canada in 1957, 1923
  immunization effects on epidemic of respiratory illness in children, [Glazier] 460—ab
  1918 epidemic, compared to Asian influenza epidemic, 2332
  on Okinawa and Oregon, 1563
  sickness claims and, United Kingdom, 435
  vaccination, (Committee announcement) 1234
  vaccination, PHS recommended for certain groups, (Asian type) 82; 798
  vaccine, United Kingdom, 2170
  virus infection, severe effects, [Forbes] 1265—ab
INH: See Isoniazid
INHALATION
  of gasoline fumes, urge in boy 5, treatment, 981
  of mercury vapor, acute poisoning from, [Matthes] 2317—ab
  therapy with hydrocortisone in asthma, [Herxheimer] 2196—ab; (and bronchitis) [Helm] 2197—ab
INJECTION
  abscess due to Candida albicans, [Eriksen] 837—ab
  forcible blood and fluid into arteries in terminal states, [Radushkevich] 1711—ab
  gasserian, alcohol for relief of tic douloureux, [Ecker] 119—ab
  intra-articular hydrocortisone, United Kingdom, 1927; (deleterious effects) [Chandler] 2302—ab
  intramuscular digoxin, [Fletcher] 437—ab
  intraosseous anesthesia in operations on extremities, [Okhotsky] 1825—ab
  intravenous diphtheria antiserum, importance of, [Tasman] 712—ab
  intravenous infusions, failure, 1733
  parenteral digitalis, 6 preparations compared, [Aravanis] 347—ab
  radioactive phosphorus intravenously, intra-arterially and intracardially for lung cancer, [Ariel] 350—ab
INSANITY: See Mental Disorders; Schizophrenic Reactions; Medicolegal Abstracts at end of letter M
INSECTICIDES
  blood cholinesterase and myasthenia gravis after exposure to, (replies) [Trimble; and original consultant] 138
  organic phosphate poisoning, histochemical proof of, [Petty] 2199—ab
  vaporizing devices for, present status, 1061
INSECTS
  bites, edema from, prevention, treatment, 360
  [illegible]
INSEMINATION, ARTIFICIAL
  [illegible] *1963
INSTITUTE: See also Societies and Other Organizations at end of letter S
  Saskatchewan Cancer and Medical Research, formally opened, 1914
INSTRUMENTS
  bandage scissors, new, [Burnham] *760
  new, for cold *conization*, [Fleming] *886
INSULIN
  in plasma, estimation, India, 2168
  "insulitis" in early juvenile diabetes, [LeCompte] 2199—ab
  murder by, United *Kingdom*, 811
  producing capacity of pancreas of children with diabetes, [Klein] 1718—ab
INSURANCE: See also Medical Service plans
  abuses, annual *report*, 1116
  A. M. A. Committees, annual reports on, 1115; 1116
  A. M. A. meets with 10 "third party" medical chiefs, [Medicine at Work] 1366
  company, ethical to disclose case history to? (Judicial Council opinion on) 1556
  federal contribution act, state participation in, A. M. A. resolution on, 64
  fees, oldsters, A. M. A. meeting report, 2148
  health, *claim forms, annual* report, 1116
  health plans under collective bargaining, 1663
  health, pre-retirement financing or "paid-up," annual report, 1116
  health, United Kingdom, 2171
  health, voluntary, annual report, 1115
  health, voluntary, experiments to provide for *retired persons*, (Bureau article) [Polner] *194
  health, voluntary, for aged, A. M. A. *resolutions* on, 65; 68
  health, voluntary, in Great Britain, surprising growth of, [Follmann] *1641
  hospital, and diagnostic services, Canada, 90
  life, reasons why people bought, annual report, 1081
  major changes made in reference to, 1100
  malpractice, contract, [Hassard] *2117
  old age and survivors program, A. M. A. resolution on, 67
  plan and public health, Canada, 1678
  research co-sponsored by Insurance Company of North America, 190—E
  sickness, claims and influenza, United Kingdom, 435
  V. A. cases, new action, (Council article) 905
  what should a doctor carry? [Business Practice] 1691
INTELLIGENCE, hypophysectomy effects on, [*Schon*] 2310—*ab*
INTERFERON
  virus growing in tissue culture prevents unrelated viruses from growing, United Kingdom, 312
INTERNAL MEDICINE
  neurosis and, Portugal, 211
  training of internists and, (Miscellany) [Rhoads] *1398
INTERNATIONAL: See also list of Societies at end of letter S
  conference on peaceful uses of atomic energy, WHO *report*, 929
  educational exchange in medicine, 1522; 1549—E
  film festivals committee to determine U. S. [illegible], 1075
  La[illegible] Union conference with physicians and other labor leaders, 289—E; 290
  Medical Film Exhibition, Ralph Creer attends Japan Medical Congress to organize and direct, 695
  Medical Year, A. M. A. support for proposed, resolution on, 2150
  symposium on physics and medicine of atmosphere and space, 797; [Medicine at Work] 1369
  travel, immunization information for, 914
INTERNS AND INTERNSHIP
  annual report and directory, Oct. 4, 521; (approved internships) 529; 694—E
  approved, *report*, 58
  Army program, 1536
  civilian and military internships, Air Force sponsored, 1541
  Council annual report on, 1092
  draft status of interns, 1534
  first year interns, senior students as clinical clerks to replace, (A. M. A. resolution on) 65; (report) 1088
  hospital which for 2 years does not obtain ¼ complement of interns may be disapproved for training, 1088
  internship aspects of medical education, 1476
  Internship Review Committee, 526
  internships by type of service, 522; 555
  National Intern Matching Program, 525; 1092
  Naval internships, 1539
  new program at U. of Washington, 296
INTERNS AND INTERNSHIP—Continued
  no single panacea for internship, *problem of shortage*, (guest editorial) [McKittrick] 693—E; (reply) [Koning] 1803—C
  shortage of interns, A. M. A. resolutions on, 67
  two-year rotating internship, (A. M. A. resolution on) 67; (report) 1087
  U. of Michigan exchange program, 791
INTESTINES
  acetylcholine content of, India, 1925
  carcinoid, primary functioning, diagnosis and management, [Sauer & others] *139
  diverticulitis, complicated, surgical management, [Colcock] 2065—ab
  helminthic infection, India, 1680
  inflammation, acute necrotizing (pseudomembranous) enterocolitis, [Kay] 1708—ab
  inflammation, chronic regional enteritis, 126 cases, [Jackson] 445—ab
  inflammation, E. coli enteritis, [Balaban] 341—ab; (in nurslings) [Tsimbler] 342—ab
  inflammation, regional enteritis, (clinical aspects and diagnosis) [Daffner] (treatment) [Brown] 2060—ab; (protein absorption) 2205
  inflammation, staphylococcic enteritis and antibiotics, Sweden, 1395
  large, papilloma of, [Goldgraber] 967—ab
  lipodystrophy, systemic involvement; cytologic observations, [Sieracki] 2199—ab
  obstruction, gallstone ileus, [Rijken] 953—ab
  obstruction, hepatodiaphragmatic interposition of jejunum, ileum, cecum and ascending colon with, [Aiken] 340—ab
  obstruction, surgical ascariasis in children, [Fernando] 1407—ab
  protozoa and helminths, acquisition by children in Egypt, [Kuntz] 1282—ab
  tumors causing intussusception, India, 1393
INTRINSIC FACTOR
  inhibiting substance in serum after oral treatment of pernicious anemia, [Schwartz] 943—ab
  treatment plus vitamin B_{12} in Biermer's disease, [Croizat] 1580—ab
INTUSSUSCEPTION
  tumors of intestine causing, India, 1393
INVALIDISM
  Greenland's, Denmark, 920
INVENOL (carbutamide): See Sulfonylureas
IODINE
  acne and, 2333
  132, applications, WHO report, 1397
  radioactive, for angina pectoris, [Segal] 346—ab
  radioactive, test, corticosteroids effects on, 1734
  radioactive, test, what factors may influence, 1731
IPRONIAZID
  phosphate, N. N. D., 286
  toxicity, 50—E; (reply) [Roble] 1802—C
  toxicity: jaundice, pathological findings, [Popper] *2235
  treatment of angina pectoris, (Switzerland) 1572; [Casellas Bernat] 1946—ab; [Master] *2324*—ab
IRON
  biliary excretion before and after intravenous iron in chronic liver disease, [Bertolini] 840—ab
  deficiency anemia in pregnancy, prophylaxis, [Kerr] 1939—ab
  ferrous succinate for hypochromic anemia, India, 1151
  galvanized container, punch in poisonous, Calif., 790
  idiopathic pulmonary hemosiderosis, [Espinoza] 340—ab
  intolerance to, United Kingdom, 924
  medullary, in rheumatic fever in children, [Bernheim] 1715—ab
  miners, pneumoconiosis in, [Even] 1720—ab
  preparations, cost of, United Kingdom, 1574
  radiologic sign in hemosiderosis, [Shanbrom *& Zheutlin*] *33
  "scrap iron" intoxication, [Gadsden & others] *1220
ISCHIUM
  removal, complication: perineal urethral diverticulum, [Comarr & Bors] *2000
ISOLATION
  of patients with staphylococcus infections, 716; (replies) [Rolf; and original consultant] 2208
  stress in medical and mental illness, [Ziskind] *1427
ISONIAZID
  mycobacteria from untreated cases of primary tuberculosis of lung, sensitivity to, [Spina] 1845—ab
  toxicity, pyridoxine to prevent, [Ross] *273; *(reply)* [Middlebrook] 1685—C
  treatment, early results in relation to serum isoniazid level, [Vivien] 325—ab
  treatment of tuberculous meningitis with Neoteben, results, [Gehrt] 1945—ab
  treatment plus PAS and streptomycin in urogenital tuberculosis, [Hansson] 1720—ab

FOR CONTROL OF MENORRHAGIA

ENOVID®

Prolonged or excessive menstrual flow of functional origin can be treated both therapeutically and prophylactically with Enovid.

The supportive action of two tablets of Enovid on the endometrium usually checks abnormal bleeding within six to twelve hours. A daily dosage of one or two tablets is then continued through the intermenstrual interval until day 25 of the cycle. The patient will menstruate approximately three days after discontinuance of therapy.

She is again treated with similar doses from day 5 to day 25 for two or three additional consecutive cycles.

A similar regimen is employed if the patient is seen during the intermenstrual interval. Even though no bleeding is present a dosage of one or two tablets daily is administered until day 25. Therapy is resumed from day 5 to day 25 for two or three successive cycles.

Each tablet of 10 mg. contains 9.85 mg. of norethynodrel, a new synthetic steroid, and 0.15 mg. of ethynylestradiol 3-methyl ether. G. D. Searle & Co., Chicago 80, Illinois.

ENOVID Oral Synthetic Endometropin
(brand of norethynodrel with ethynylestradiol 3-methyl ether)

SEARLE | *Research in the Service of Medicine*

BREACH THE INFLAMMATORY WALL

ACCELERATE TISSUE REPAIR

The wall of leukocytes and fibrin that surrounds every site of inflammation breaks down when Parenzyme is administered *systemically* and/or *topically*.
Parenzyme depolymerizes macromolecules trapped in the capillary wall and connective tissue—permits access of anti-infective agents, accelerates tissue repair, resolves inflammation and edema.

PARENZYME® AQUEOUS
PARENZYME®-B *(buccal tablet)*
PARENZYME® OINTMENT

Parenzyme *Aqueous* — sterile multiple-dose vials containing lyophilized trypsin, 25 mg. plus 5 ml. of aqueous diluent. **Parenzyme-*B*** — buccal tablet containing 5 mg. trypsin. **Parenzyme *Ointment*:** containing 2 mg. crystalline trypsin, 6 mg. crystalline chymotrypsin and 2 mg. 9-aminoacridine hydrochloride in a specially prepared water-soluble base.

Products of Original Research NATIONAL THE NATIONAL DRUG COMPANY
Philadelphia 44, Pa.

7761/59

PAIN

Zactirin®

Ethoheptazine Citrate with Acetylsalicylic Acid, Wyeth

for everyday pain control . . .

for your many patients requiring potent analgesia but not an injected narcotic

Proved by extensive evaluation[1,2,3] in 1998 patients in diverse areas of medicine and surgery, including:

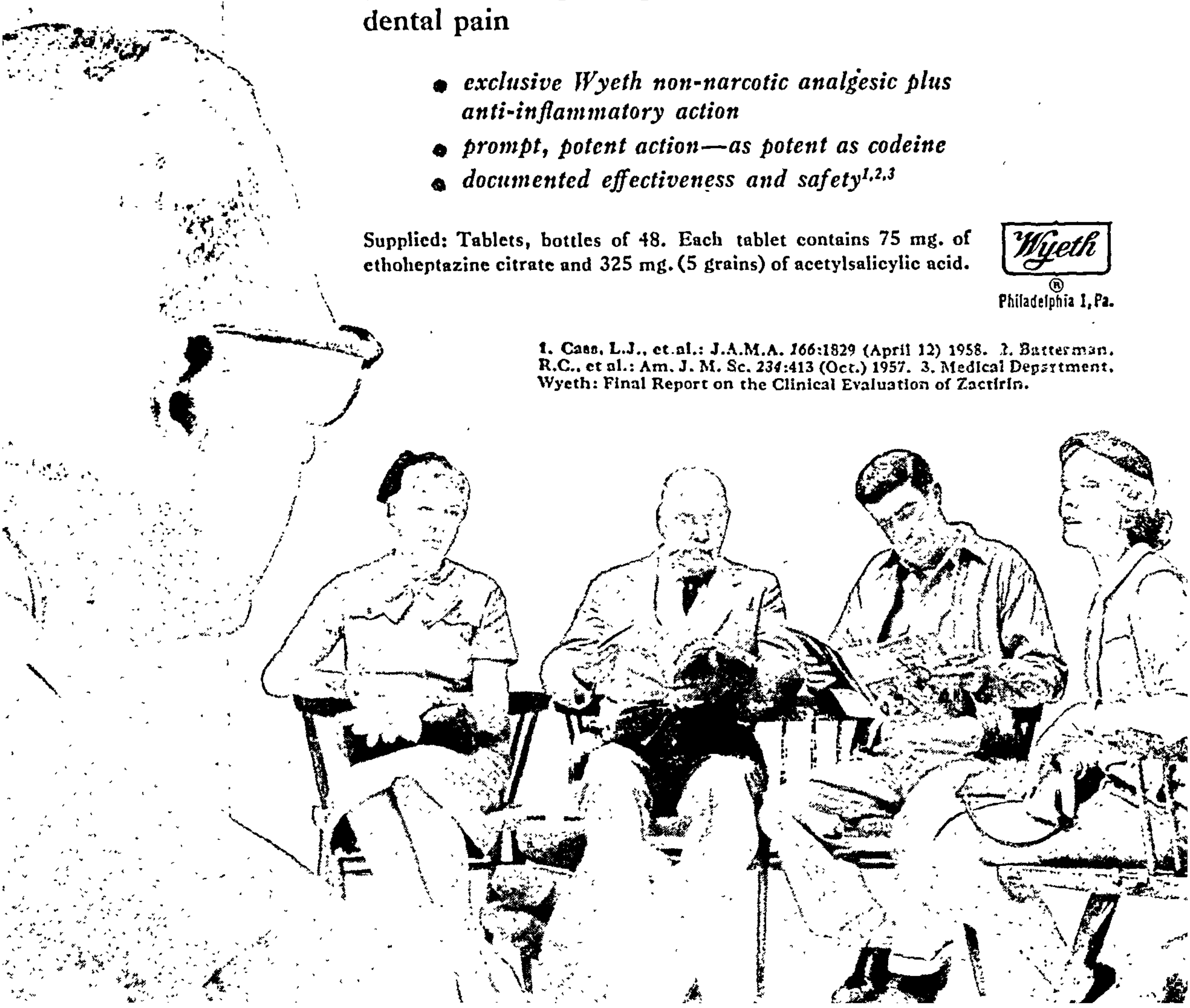
arthritis, bursitis, early metastatic carcinoma, fibrositis, grippe, herpes zoster, ligamental strain, low back pain, menstrual pain, myalgia, myositis, neuritis, pleurisy, postoperative pain, postpartum pain, sciatica, trauma, dental pain

- *exclusive Wyeth non-narcotic analgesic plus anti-inflammatory action*
- *prompt, potent action—as potent as codeine*
- *documented effectiveness and safety[1,2,3]*

Supplied: Tablets, bottles of 48. Each tablet contains 75 mg. of ethoheptazine citrate and 325 mg. (5 grains) of acetylsalicylic acid.

Wyeth®
Philadelphia 1, Pa.

1. Cass, L.J., et al.: J.A.M.A. 166:1829 (April 12) 1958. 2. Batterman, R.C., et al.: Am. J. M. Sc. 234:413 (Oct.) 1957. 3. Medical Department, Wyeth: Final Report on the Clinical Evaluation of Zactirin.



IAZID—Continued
treatment plus streptomycin in tuberculosis meningitis, [Giova] 410—ab
NICOTINIC ACID HYDRAZIDES: See Iproniazid; Isoniazid
PYL ALCOHOL
"scrap iron" intoxication, [Gadsden & others] *1220
ENOL (Isopropylarterenol)
intravenously with cardiac pacemaker for asystole complicating acute myocardial infarction, [Solarz & others] *2124
OPES
Radioactive: See Radioactive Isotopes; and under specific elements as Iodine
: See Isoproterenol
NG
of tongue, treatment, 1123
signs and symptoms in chronic renal failure, [Effersøe] 214—ab
'NE, Belgium, 2290

J

J. A. M. A.: See American Medical Association Journal
JAPAN
Medical Congress, (Ralph Creer to organize and direct international film exhibition) 695; (report) 1073
JAUNDICE
Epidemic: See Hepatitis, Infectious
etiology: chlorpromazine; clinical course, hepatic function, pathology, [Gebhart] 107—ab
etiology: chlorpromazine, Israel, 2044
etiology: iproniazid, 50—E; (reply) [Roble] 1802—C; (pathologic findings) [Popper] *2235
hazards of therapeutics, [McHardy] *1868
icterus gravis neonaturm, colisepsis as cause of, [Pielage] 833—ab
in newborn, differential diagnosis, serum transaminase in, [Kove & others] *860
JAWS
tumors, osteogenic sarcoma, [Kragh] 2304—ab
unilateral temporomandibular joint pain, diagnosis and treatment, 472
JEJUNUM
interposition operation, 33 cases, [Thomas & Merendino] *1759
JENKINS-KEOGH BILLS
A. M. A. annual reports, 1047; 1080
A. M. A. resolutions endorsing principles of, 66
JEWELRY
gems and precious stones, [Leisure Corner] 1261
JEWS
Oriental, hemolytic trait in, Israel, 94
Sephardic, blood groups in, Israel, 94
JOINT
Commission on Accreditation of Hospitals, (automatic stop order on dangerous drugs; restrictive effect of board certification, A. M. A. resolutions on) 65; (standards and requirements, A. M. A. resolution on) 68; (resolution on Section on Obstetrics and Gynecology representation on) 898; (A. M. A. report on) 1092
Commission on Mental Illness and Health, annual report on, 1053
Committee on Health Problems in Education, annual report on, 1080
Committee on Medical Education for National Defense: See under Education, Medical
Committee on Mental Health in Industry of A. M. A., troubled employee, (Medicine at Work) [Golin] 1371; 1377—E
Conference Committee, A. M. A. and American Hospital Association recommend hospitals set up, 1233
Council to Improve Health Care of Aged, (A. M. A. resolutions on) 65; 68; (report) 1102
National Commission for Improvement of Care of Patient, (recommends individual hospitals form committees) 52; (report) [Medicine at Work] 1894
JOINTS
lumbosacral, transfixing, 2331
osteoarticular lesions in smallpox, India, 1255
subtalar, extra-articular arthrodesis of, for cerebral palsy, [Baker & Dodelin] *1005
tuberculosis activated by local hydrocortisate, [Jørgensen] 713—ab
JOURNALS
A. M. A. magazine relations, annual report, 1050
American Medical Writers' Association honor awards in medical journalism, 1562
Armed Forces medical publications, Col. Benford named director, 1247
California GP, article reprinted from, (Miscellany) 931
Civil Defense Review, publication of, 1072

JOURNALS—Continued
Drug Standards, monographs of tests and assays for new and nonofficial drugs published in, 41; 185; 1012
Journal of the A. M. A.: See American Medical Association
medical, advertising in, A. M. A. resolution on, 69
pharmacology, three new ones, 1245
Society for Invest[illegible] cated issue to Dr [illegible]
JURISPRUDENCE, [illegible] Jurisprudence

K

KANAMYCIN
new antibiotic, misuse of, [Mann] 814—C
KANTREX: See Kanamycin
KELOIDS
treatment, oral, [Kelly] 2073—ab
KERATITIS
interstitial, nonsyphilitic, and bilateral deafness (Cogan's syndrome) with cardiovascular disease, [Eisenstein] 108—ab
KERNICTERUS
in premature infants associated with low bilirubin level in plasma, [Harris] 461—ab
17-KETOSTEROIDS
urinary excretion in leishmaniasis, India, 209
KIDNEYS
artificial, in control of accidental poisoning, [Cann & others] *717
artificial, Kolff twin coil, [Holmes] 1414—ab
biopsy, France, 1797
biopsy specimens from patients with hypertension; histology, [Sommers] 970—ab
calculi (calcium), excretion of calcium and inorganic phosphate in, [Hodgkinson] 1820—ab
calculi complicating rehabilitation of respirator patient, [Neu] *1610
cystic disease in infants, [Hooper] 466—ab
disease, chronic, in children; correlate clinical findings with morphology, [Vernier] 1942—ab
disease, low-sodium diets in, (Council report) [Danowski] *1886
disease, nephrectomy in juvenile hypertension with, [Welch] 463—ab
disease, nephrolithiasis in children, diagnosis, [Diligenskaya] 341—ab
disease (nephrosis) in children and adults, prolonged intermittent steroid therapy for, [Lange & others] *377
disease (nephrotic syndrome) complicating mercurial diuretic therapy, [Riddle] 126—ab
disease (nephrotic syndrome) in man 38, treatment, 1956
disease (nephrotic syndrome, reversible) with congestive heart failure, [Burack] 2298—ab
foreign bodies in, needle within calyces, [Naulleau] 344—ab
function in patients recuperated from severe hypertension with treatment, [Caeiro] 819—ab
function, preserve during partial nephrectomy, rubber band tourniquet for hemostasis, [Goodwin & Thelen] *179
function test in leprosy, India, 1797
function tests abnormal in Coxsackie B virus infection, [Utz & Shelokov] *264
Goldblatt, nephrogenic hypertension after operative trauma to renal artery, [McDonald] 451—ab
Inflammation: See Nephritis
insufficiency (acute failure) and generalized pain, (Diagnostic Problems) [Kushner & Szanto] *1778
insufficiency (acute failure), atypical heat stroke with, [Baxter] 109—ab
insufficiency after delivery, prognosis, [Thaysen] 1275—ab
insufficiency (chronic failure), signs and symptoms, [Effersøe] 214—ab
nephrogenous polycythemia, [Forssell] 1821—ab
papillary necrosis, [Hultengren] 961—ab
papillary necrosis, roentgen diagnosis and formation of calculi, [Lagergren] 130—ab
primary renal hypokalemia vs. primary aldosteronism, [Alsted] 1578—ab
renal hypertension as consequence of increased arterial pressure, study in rats, [Masson] 2076—ab
rupture, management of severely injured patient, [Schulte] *2094
surgery, subcapsular nephrectomy, [Kittredge & Fridge] *758
transplantation between 7 pairs of identical twins, [Murray] 2190—ab
KLINEFELTER SYNDROME
chromatin-positive, true; relation to feeblemindedness, [Prader] 2193—ab
KNEE
arthrosis of, Sweden, 2294
compression in arthrodesis, comparative methods of fusion, [Stewart] 328—ab

KOPLIK, HENRY (1858-1927)
centennial exhibit, N. Y., 1911
KRAUROSIS
leukoplakia syndrome, vulvar, topical androgens for, [Richardson] 2312—ab
KRUSEN, FRANK HAMMOND, A. M. A. Distinguished Service award to, 53
KWASHIORKOR
dried skimmed milks and, [Pretorius] 223—ab
4 cases from Louisiana, [Henington] 1277—ab
KYASANUR Forest disease, India, 804
KYNEX: See [illegible]
Acetyl: See [illegible]
KYPHOSCOLI

L

LSD: See *d*-Lysergic Acid Diethylamide
LABELS
of chemical products, draft model bill to require warning of hazardous ingredients, 1062
LABOR
acute renal insufficiency originated after, prognosis, [Thaysen] 1275—ab
after previous cesarean section, India, 2042
cesarean section for cephalopelvic disproportion after previous vaginal deliveries, [Davila] 2069—ab
midline episiotomy, Brazil, 88
premature, associated with malaria, United Kingdom, 1927
premature, USPHS grant for study of, Pa., 701
promethazine in, 2½ year survey, [Carroll & Moir] *2218
pulmonary hyaline membrane contamination of lungs by fluid of birth canal, studies in rabbits, [Snyder] 120—ab
rupture of normal spleen in infant during, [Hottinger] 461—ab
type of, evaluation of newborn infant, [Apgar & others] *1985
LABOR (industrial): See Industrial Accidents; Industrial Diseases; etc.
LACERATIONS
in boxers, relation to renal injury, [Kleiman] *1633
LACRIMATION
tear gas exposure, treatment, 1167
LACTATION
deodorants relation to supply of milk, 1297
precordial murmurs during, [Hurst] 1939—ab
Vanderbilt study of maternal and infant nutrition, (Council article) [McGanity & others] *2138
LACTIC ACID
bacilli in cow's milk, source of, 981
LAL, GOBIND BEHARI A. M. A. distinguished service citation to, 53
LAMBLIASIS: See Giardiasis
LAPAROSCOPY
value in ascitic syndromes presenting diagnostic difficulties, [Girard] 2189—ab
LAPAROTOMY: See Abdomen surgery
LARGACTIL: See Chlorpromazine
LARVA MIGRANS
ancylostomiasis braziliensis, [van Zeben] 833—ab
LARYNGITIS
functional, 1733
LARYNX
minor sequelae after endotracheal intubation, [Wolfson] 1417—ab
obstruction, prednisone treatment, India, 707
stridor in rheumatoid arthritis, [Darke] 123—ab
LATEX
fixation test, slide, in diagnosis of rheumatoid arthritis, [Singer & Plotz] *180
LAWS AND LEGISLATION
activities of Woman's Auxiliary, 1048
A. M. A. Committee annual report, 1046
draft model bill requiring identification of hazardous ingredients on chemical labels, 1062
federal, A. M. A. statement regarding appropriation for military dependents before Senate committee, 1551
federal, compliance with Miller Pesticide Amendment to FDA Act, 1061
federal, current legislation on medical care to indigent, annual report, 1106
federal; legislative developments in veterans' affairs, annual report, 1105
federal, second session, 85th Congress, annual report, 1047
federal, state participation in insurance contribution act, A. M. A. resolution on, 61
federal, V. A. insurance cases, new action, (Council article) 905
federal, Washington Office annual report, 1048
federal, Washington Office summary, 780; 1124
Forand Bill: See Forand Bill
Jenkins-Keogh Bills: See Jenkins-Keogh Bills
medical care for indigent in 1958, (Council report) 2151

LAWS AND LEGISLATION—Continued
  Social Security: See Social Security
  state legislative keyman organization, annual report, 1048
LAWYERS: See Attorneys
LAXATIVES: See Cathartics
LEAD
  poisoning, edathamil calcium-disodium for, [Cann & others] *717
LECITHIN
  in diet, can one use too much? 1168
LECTURES
  Albany Medical College, annual honorary lectureship award, 1241
  American College of Preventive Medicine, 911
  Biddle (Andrew P.), Mich., 74
  Brodel Memorial, 702
  Brown (Aaron), N. Y., 1382
  Brown (George Elgie) Memorial, 420; 912
  Caldwell, 122
  Conner (Lewis A.) Memorial, 912
  Craig (Charles F.), 1244
  Danforth (Murray S.) Oration, R. I., 1243
  Friedenwald Memorial, Md., 1381
  Gregg (Alan), first, 201
  Harrington, N. Y., 1559
  Heron (Ivan C.), Calif., 418
  International College of Surgeons' third series, Chicago, 1787
  Jackson Memorial, 702; (ocular toxoplasmosis) [Hogan] 2322—ab
  James (William) Lectures, Mass., 1381
  Judd-Plummer Memorial, Minn., 1788
  Memorial Fund Lecture, [Osserman] 1585—ab
  Mueller (J Howard) Memorial, Mass., 2029
  New York Academy of Medicine, lectures for laity, 1382
  North Shore Hospital series on "Emotional Forces in the Family," Ill., 418; 1139; 2156
  Phemister (Dallas B.), Ill., 699
  Phi Delta Epsilon Fraternity, (Cincinnati: Cleveland) 1242; (Ind.) 2156
  Pincoffs (Maurice C.), second lecture in internal medicine, Md., 1666
  Reiss (Herman L.) Memorial, N. Y., 793; 1141
  Sacramento County Hospital, Volunteer Medical Staff, second annual lecture honoring, Calif., 1665
  Schoenberg Memorial, N. Y., 1789
  Silverman (Hilda Freeman), N. Y., 1788
  Squibb Centennial Lectures, (Chicago) 1381; (first) 2033
  Stieglitz (Edward Julius) Memorial, first, Pa., 1789
  Strauss (Alfred A.), Wash., 296
  Truman (Stanley R.), Calif., 417
  Tulane U. Lectureship in Social Psychiatry, 2029
  Virchow (Rudolph) centennial, 798
  Wadsworth (Augustus B.), N. Y., 792; 1382
  Webster (James R.) Memorial, 1563
  Wechsler (Israel S.), N Y., 1911
  Wherry Memorial, 702
  Williams (Linsly R.) Memorial, N. Y., 1382
  Wyckoff (John), N. Y., 1241
  Wyeth Lectureship, 1561
LEDERBERG, JOSHUA, Nobel prize to, 1915; 2159
LEGAL MEDICINE: See Medical Jurisprudence
LEGISLATION: See Laws and Legislation
LEGS: See also Extremities
  chronic ulcers, and tetanus, [Rits] 1700—ab
LEIOMYOSARCOMA
  of stomach, [Mason] 2183—ab
LEISHMANIASIS
  blood proteins in, India, 433
  Leishmania donovani, tissue culture, Canada, 2291
  splenectomy for, India, 1798
  urine 17-ketosteroids in, India, 209
LEISURE CORNER: See Physicians, avocations
LENS, CRYSTALLINE
  acrylic lens operation, 1838
  Retrolental Fibroplasia: See Retrolental Fibroplasia
LENTICULAR NUCLEUS
  globus pallidus, experience with chemopallidectomy, [Paxton & Dow] *755
  hepatolenticular degeneration, biochemical disturbances, [Enger] 2061—ab
LEPROSY
  kidney function test in, India, 1797
  prevention, BCG vaccine for, Brazil, 1677
LEPTOCYTOSIS
  familial, and erythremic myelosis, [Olshin] 1281—ab
LERICHE SYNDROME
  aortic thrombosis, [Starer] 214—ab
  impotence, early diagnostic sign, mechanism; endarterectomy for, [O'Conor] 1944—ab
LERITINE: See Anileridine
LEUKEMIA
  acute, in adult, effect of 6-mercaptopurine in, [Kenis] 347—ab
  acute, in adults, prednisone and prednisolone for, [Granville] 1286—ab
  acute, metacortandracin for, [Picard] 1264—ab
  acute, treatment, France, 209
LEUKEMIA—Continued
  etiology, toxic agent in, [Scheuer-Karpin] 1265—ab
  genetic background for, 137
  H-bomb exposure and, United Kingdom, 926
  in children, evolution in course of treatment, [Chaptal] 960—ab
  in infant due to radiation in mother during pregnancy, United Kingdom, 314
  lymphoid, developed in child after infection, [Tudor] 930—C
  radiation-induced, factor in thymus predisposes mice to, United Kingdom, 312
  research grants in, 1561
  treatment, 6-chloropurine, [Ellison] 1584—ab
LEUKOCYTES
  count, leukopenia complicating staphylococcic endocarditis treated with ristocetin, [Weber] *1346
  morphology, polymorphonuclear, reliability in determining genetic sex, [Cooper] 831—ab
  sedimentation rate in lymphosarcoma, reticulosarcoma and malignant lymphogranuloma, [Bellesia] 2075—ab
  sedimentation rate in tuberculosis and septic infections, [Lusvarghi] 2200—ab
LEUKOPLAKIA
  kraurosis syndrome, vulvar, topical androgens for, [Richardson] 2312—ab
LEVULOSE: See Fructose
LIABILITY: See Malpractice
LIBEL AND SLANDER: See Medicolegal Abstracts at end of letter M
LIBRARY
  A. M. A. Library, annual report, 1042
  National Library of Medicine, plans for new building, 2280
  of Council of Royal Society of Medicine, Rockefeller Foundation grant for, United Kingdom, 2296
LICENSURE
  Annual Congress on: See American Medical Association
  annual report of Law Department, 1045
  by reciprocity, (A. M. A. resolution on) 71; (report) 1088
  central repository of medical credentials, annual report on, 1070
  of American graduates of foreign medical schools, 1524
  of naturopaths, etc., A. M. A. activities in case of convicted psychiatrist, Dr. Reddick, who issued licenses, 1064
  of paramedical groups, report, 2149
LIDOCAINE HYDROCHLORIDE
  as spinal anesthetic, pharmacology, [Featherstone] *1327
LIFE
  expectancy after splenectomy, 1837
  expectancy among radiologists, United Kingdom, 311
  expectancy 20 years longer, 80
LIGHTING
  fluorescent, effect on vision, (Council report) 47
  fluorescent tube, proptosis after explosion of, 1295
von LINNÉ, KARL (1707-1778)
  autobiographies, Sweden, 1800
LIPIDS: See Blood lipids
LIPODYSTROPHY
  intestinal, Whipple's disease, systemic involvement; cytology, [Sieracki] 2199—ab
LIPOMA
  [illegible] 1—ab
  [illegible] (Pyrexal), for inflammation of adnexa, [Fricke] 1273—ab
LIPOPROTEINS
  protein moieties, characterization of, U. of Florida to study, 790
LIQUAEMIN: See Heparin
LISTERIOSIS
  in mother and child, [Kranendonk] 1275—ab
LITTLE'S DISEASE: See Paralysis, cerebral
LIVER
  biopsy (needle), postbiopsy mortality in metastatic neoplasm, [Fisher] 1811—ab
  cirrhosis, ammonia intoxication in, after chlorothiazide, [Magid & others] *35
  cirrhosis (biliary) and ulcerative colitis, treatment, 1297
  cirrhosis, coma produced by carbonic anhydrase inhibitors in, [Rissel] 2301—ab
  cirrhosis, packed erythrocyte transfusions for, India, 1150
  cirrhosis, pleural manifestations in, France, 92
  cirrhosis (portal), heart disease in patients dying of, [Lunseth] 2180—ab
  cirrhosis, pruritus complicating, treatment, 1297
  cirrhosis, serum proteins in, India, 1151
  cirrhosis with ascites, low-sodium diets in, (Council report) [Danowski] *1886
  coma in surgical patients, diagnosis and management, [Najarian] 950—ab
  coma, massive doses of cortisone in, [Pressar] 324—ab
LIVER—Continued
  disease and spider nevi, India, 1925
  disease, blood ammonia in, [Li] 1578—ab
  disease (chronic), biliary excretion of copper and iron before and after intravenous use of the metals in, [Bertolini] 840—ab
  disease, clinical significance of serum cyanocobalamin in, [Rachmilewitz] 106—ab
  disease, diagnostic value of serum-transaminase in, [Pryse-Davies] 443—ab
  disease, hepatosplenomegaly in children, Brazil, 1254
  function tests and oral cholecystography, correlation, 2082
  function tests in chlorpromazine jaundice, [Gebhart] 107—ab
  function tests, India, 1257
  glycogenesis, effects of corticosteroids upon, [Fodden] 969—ab
  hepatodiaphragmatic interposition of jejunum, ileum, cecum and ascending colon with intestinal obstruction, [Aiken] 340—ab
  Hepatolenticular Degeneration: See Lenticular Nucleus
  Inflammation: See Hepatitis, Infectious
  insufficiency and coma, electroencephalographic abnormalities in, [Bogacz] 456—ab
  insufficiency, neuropsychiatric symptoms in, [Harvald] 216—ab
  metastases, differential diagnosis, Austria, 1797
  necrosis, subacute, and postnecrotic cirrhosis due to anicteric viral hepatitis, [Klatskin] 1811—ab
  pathological findings in jaundice after iproniazid, [Popper] *2235
  precirrhosis, its clinical entity, [Aron] 1401—ab
  toxic effects of alcohol on, serum transaminase activity in alcoholism, [Bang & others] *156
LOBECTOMY; LOBOTOMY: See Brain surgery
LONGEVITY: See Life expectancy; Old Age
LUNGS
  abscess, postpneumonic, lobectomy in infancy and childhood for, [Moore] 2308—ab
  Artificial Heart-Lung: See Oxygenator Pump
  cancer and air pollution, Belgium, 2167
  cancer and smoking, public's views on, United Kingdom, 1573
  Cancer (Bronchogenic): See Bronchus cancer
  cancer, death rates in England and Wales compared with U. S., (United Kingdom) 1395; [Hammond] 2058—ab
  cancer, metastatic from thyroid, treatment, 1953
  cancer, [illegible] 839—ab
  cancer, [illegible] -ab
  cancer, [illegible] " as routine proced [illegible] —ab
  cancer, radioactive phosphorus intravenously, intra-arterially and intracardially for, [Ariel] 350—ab
  cancer, surgery for, [Churchill] 1816—ab
  cancer, United Kingdom, 318
  cancer without roentgen findings, [Hansen] 1815—ab
  collapse, atelectasis in asthma in children, [Luhr] 2194—ab
  collapse, rehabilitation in respiratory paralysis, [Neu] *1610
  decortication in purulent pleurisy, France, 91
  disease, specific, ethereal oils combined with streptomycin for, [Liener] 438—ab
  edema, intractable, emergency commissurotomy in, [Wessel & Webster] *1211
  Emphysema: See Emphysema
  function tests, India, 1681
  Hyaline membrane: See Hyaline Membrane
  idiopathic hemosiderosis, [Espinoza] 340—ab
  infection, chronic, aerosol penicillin for? 2083
  infiltration and fibrosis, risk of developing tuberculosis, [Chase] 2059—ab
  involved in cryptococcosis, [Pelaez] 321—ab
  lesions, thromboembolic, frequency, Denmark, 1924
  lesions, tolazoline and lymph node biopsy in, Brazil, 2040
  lethal complications of Asian influenza, treatment, [Moeschlin] 1158—ab
  malfunction, oxygen-15 to study, WHO report, 1396
  metastases and processes with suspected metastases, operative treatment, [Hansen] 1815—ab
  of aged and emphysema, [Mayer] 1810—ab
  pathergic granulomatosis, [Hood] 944—ab
  pathology, perinatal, [Briggs] 460—ab
  pulmonary hypertrophic osteoarthropathy absent in tuberculosis, [Skorneck] 108—ab
  reserve, reduced, indications and contraindications for tracheal fenestration, [Mayer & others] *169
  single, anesthesia in surgery, [Zhorov] 1417—ab
  Surgery: See also Tuberculosis of Lung
  surgery, postoperative venous thrombosis and pulmonary embolism in, [Merlo] 330—ab

- LUNGS—Continued
  - torulosis, [Jacobs] 1949—ab
  - [illegible]ology and [illegible] for, side- [illegible] *1208
  - generalized, long-term prednisone in, [Kanee] 1812—ab
  - pemphigus seborrheicus, [Chargin] 1163—ab
  - systemic, and precipitation test, (reply) [Dubois & others] 813—C
  - systemic, pleuritis in early diagnosis, [Winslow] 946—ab
  - systemic, simulating acute surgical condition of abdomen, [Pollak] 1704—ab
  - systemic, triamcinolone for, (United Kingdom) 1258; (results) [Dubois] 1948—ab
  - transplacental passage of L. E. factor, [Mijer] 221—ab
- LYMPH
  - protein changes in chronic filariasis, India, 1798
- LYMPH NODES
  - biopsy in lung lesions and cancer of esophagus, Brazil, 2040
  - cervical, palpable, [Sage] *496
  - ce[illegible] atment, [Schmid] [illegible] aspects) [Beck] [illegible]
  - prescalene biopsy, [Wilson] 2187—ab
  - scalene biopsy, clinical evaluation and application, [Shapiro] 2306—ab
  - tracheobronchial, tuberculous, involvement in maturity, [le Melletier] 110—ab
- LYMPHADENITIS
  - suppurative, due to BCG, [Mande] 324—ab
  - tuberculous, trypsin for, [Rapoport] 1581—ab
- LYMPHANGIOMA
  - of genitalia in children, [Gueukdjian] 1279—ab
- LYMPHEDEMA
  - chronic, of arm, treatment, 1834
- LYMPHOBLASTOMA
  - follicular, giant, radioisotopes for, [Lawrence] 443—ab
- LYMPHOGRANULOMA
  - malignant, leukocyte sedimentation rate in, [Bellesia] 2075—ab
- LYMPHOMA
  - benign, of rectum and anus, [Holtz] 115—ab
- LYMPHOSARCOMA
  - alcohol-induced pain in, [Braun & Shnider] *1882
  - in childhood, [Rosenberg] 1943—ab
  - leukocyte sedimentation rate in, [Bellesia] 2075—ab
- *d*-LYSERGIC ACID DIETHYLAMIDE
  - treatment (adjunctive) in alcoholism, [Smith] 2068—ab
- LYTIC DRUGS
  - new Soviet drugs for potentiated anesthesia, [Kazansky] 1824—ab

M

- MEND: See under Education, Medical
- MACROGLOBULINEMIA
  - Waldenström's, resembling multiple myeloma, [Hampton] 821—ab
- MAGAZINES: See Journals
- MAGNESIUM
  - sulfate dressings, rationale of use, (replies) [Tredici; and original consultant] 1298
- MALARIA
  - association with prematurity, United Kingdom, 1927
  - complications: splenomegaly, India, 1680
  - therapy in Buerger's disease, [Corelli] 1723—ab
- MALPRACTICE: See also Medical Jurisprudence; Medicolegal Abstracts at end of letter M
  - Committee on Medicolegal Problems, annual report, 1046
  - expert witness and advisory panels, [Sadusk] *2121
  - hospital liability, annual report on, 1045
  - insurance contract, [Hassard] *2117
  - medical liability, annual report on, 1044; 1045
  - tort liability of charitable hospitals to patients, [Medicine and the Law] 788
- MALUCIDIN
  - yeast antibiotic with therapeutic and prophylactic properties, [Parfentjev] 1724—ab
- "MAN Who Didn't Walk," medicolegal film, [Medicine and the Law] 72
- MANSON, MARTIN L., wanted by F. B. I., (photo) 2160
- MARCUMAR: See 3-(1-Phenylpropyl)-4-Hydroxycoumarin
- MARFAN'S SYNDROME: See Arachnodactyly
- MARRIAGE
  - annulment and epilepsy, United Kingdom, 435
  - compulsory premarital blood testing, results of epidemiologic study, 289—E
  - consanguineous, and heredity in second generation, (replies) [Roderick; and original consultant] 363; 364
- MARRIAGE—Continued
  - decline in number of, 77
  - premarital examination, [Scholten] *1171
- MARSILID: See Iproniazid
- MASKS
  - in operating room, for patients with staphylococcic infections, 716; (replies) [Rolf; and original consultant] 2208
- MASTITIS: See Breast inflammation
- MASTOIDITIS
  - complications in antibiotic era, [Morrow] 124—ab
- MATCHING PLAN: See Interns and Internships
- MATERNITY
  - A. M. A. Committee on Maternal Care, annual report, 1108
  - mortality, (Brazil) 706; (Canada) 1678
  - mortality due to pulmonary embolism by amniotic fluid, [Carone] 2314—ab
  - mortality, factors in decline of, [Klein & Clahr] *237
  - mortality in ectopic pregnancy, [Malkasian & others] *985
  - Vanderbilt study of maternal and infant nutrition, (Council article) [McGanity & others] *2138
- MATROMYCIN: See Oleandomycin phosphate
- MEASLES
  - complications, India, 1257
  - distemper relationship, [Adams] 354—ab
  - modification, hazards of using parental blood for, (replies) [Berryhill; and original consultant] 1170
- MECAMYLAMINE
  - treatment of hypertension, (India) 209; [Lucchelli] 834—ab
  - treatment of hypertension, potentiate with chlorothiazide, [Rochelle & others] *410
- MEDIASTINUM
  - anterior, tumors of, [O'Gara] 223—ab
  - tumors, azygos vein dilatation simulating, [Shuford] 971—ab
- MEDICAL . . . For most entries see under noun concerned as Economics, Medical
- MEDICAL CARE: See Medical Service
- MEDICAL CAREERS
  - film: "Helping Hands for Julie," annual report, 1075
- MEDICAL CENTER: See also Health center
  - A. M. A. meets with 10 "third party" medical chiefs, [Medicine at Work] 1366
  - Chicago's West Side, new building, 2156
  - outpatient pastoral counseling in, [Young & Patrick] *24
- MEDICAL DAYS
  - A. M. A. support for proposed International Medical Year, resolution on, 2150
  - Cohen (Samuel E.) Memorial Teaching Day, N. Y., 419
  - Diabetes Week, Nov. 16-22, 297
  - U of Illinois Medical Alumni Seminar Day, 1139; 1557
  - "Visiting Chief Day" at Sinai Hospital, Mich., 1558
- MEDICAL EDUCATION FOR NATIONAL DEFENSE (MEND): See Education, Medical
- MEDICAL EXAMINERS
  - system, annual report, 1046
- MEDICAL JURISPRUDENCE: See also Malpractice; Medicine and the Law; Medicolegal Abstracts at end of letter M
  - A. M. A. Committee on Medicolegal Problems, annual report, 1046
  - A. M. A. Law Department, annual report, 1043
  - damages for widow of physician who died in line of duty, United Kingdom, 315
  - doctor fined for giving prescriptions for meperidine for own use, United Kingdom, 1153
  - ethical to discuss case with patient's lawyer? (Judicial Council opinion on) 1555
  - expert witness and advisory panels, [Sadusk] *2121
  - impartial medical testimony, 50—E
  - legal hurd[illegible] ting up [illegible]
  - "Man Wl[illegible] [Medici[illegible]
  - MEDICOLEGAL ABSTRACTS, annual report, 1045
  - medicolegal aspects of occupational dermatoses, (Council report) 1351
  - "Medicolegal Forms with Legal Analysis," annual report on, 1044
  - National Interprofessional Code for Physicians and Attorneys, 1661—E; [Medicine and the Law] 1663
  - opinions of 10,000 lawyers sought in medicolegal study, [Medicine at Work] 1899
  - physicians need not give death certificates, United Kingdom, 2045
  - seminar on personal injury, Va., 295
  - U. of Pittsburgh established health law center, 295
- MEDICAL PREPAREDNESS: See also Civil Defense
  - [Hays] *254
  - draft status of faculty members, interns and residents, 1534
  - extension of draft act, (A. M. A. resolution on) 71; (report) 1068; (law expires; new law provides for specialism) 1535
- MEDICAL PREPAREDNESS—Continued
  - maneuvers after mock nuclear explosion, United Kingdom, 2172
  - national defense and medical education, selective Service System, 1533
  - physical examination of physicians for Armed Forces, 1249
  - physicians subject to draft call in 1959, (Council report) 906
  - survey of physicians separated from military service, (Council survey) 1904
- MEDICAL RECORDS
  - central repository of medical credentials, 1070
  - diagnosis and reporting occupational diseases, [Johnstone] *1844
  - industrial, A. M. A. Committee on, annual report, 1066
  - librarians, schools for, 1543
  - technicians, schools for, 1544
- MEDICAL RESEARCH COUNCIL (England)
  - annual report, 312
  - antigenic activity of British poliomyelitis vaccine, [Perkins] 118—ab
- MEDICAL SERVICE
  - Alabama Community Medical Rating survey, (Council survey) 1378
  - American citizens' basic rights, A. M. A. resolution on, 69
  - A. M. A. *ad hoc* Committee on Medical Services for Construction Projects, new, 1067; (guide for) 1901
  - A. M. A. Committee on Medical Care for Industrial Workers, annual report, 1109
  - A. M. A. Council on, annual report, 1100
  - cost of, annual report, 1107
  - for Armed Forces Dependents: See Medicare
  - for Indigent: See Medically Indigent
  - plan of UMWA, relationships between medical profession and administrators of, A. M. A. resolutions on, 56; 66
  - planning medical facilities, annual report, 1114
  - plans, A. M. A. Committee on Prepayment Medical and Hospital Service, annual report, 1115
  - plans, Commission report, 56
  - plans, free choice of physician in, (A. M. A. resolution on) 64; (President's page) 416
  - plans, guide for judgment of third party plans, A. M. A. resolution on, 70
  - plans, major changes made, annual report, 1100
  - plans, medicine meets with labor, 289—E; 290
  - plans, part 2 of final report of A. M. A. Commission on, [Medicine at Work] 1367
  - plans report, A. M. A. meeting, 2149
  - plans, status report of Commission on National Emergency Medical Care plan, 58
  - plans, Suggested Guides for Medical Society Sponsored Voluntary Prepayment Plans, action on, 59; (report) 1116
  - plans under collective bargaining, 1663
  - plans, voluntary, [Medicine at Work] 1363
  - proposed regionalization in Puerto Rico, A. M. A. resolution on, 69
  - providing good service, [Business Practice] 1806
  - query 313 on ideas of, [Medicine at Work] 1895
  - review book on medical care, (Bureau article) [Bornet] *2025
  - type rendered, Medicare effect on, [Robinson] *1630
- MEDICAL SUPPLIES
  - counteract mock alert shortages with substitutions, [Medicine at Work] 773
  - for poisoning emergencies, [Bidder & Sunshine] *514
- MEDICALLY INDIGENT
  - A. M. A. Committee on Indigent Care, (annual report) 1105; (study state programs) [Medicine at Work] 1893
  - A. M. A. resolution on care for, 64; 70
  - care for in 1958, (Council report) 2151
  - endorse Vendor payments to physicians for services to, annual report, 1106
  - health services to, A. M. A. action at Minneapolis, (President's page) 2273
  - legislation on medical care for, annual report, 1106
  - physician's share of public costs for, [Medicine at Work] 770
  - public assistance, annual report, 1107
  - study medical care in Florida, [Medicine at Work] 1365
- MEDICARE
  - A. M. A. resolutions on, 64; 66
  - A. M. A. statement regarding appropriations for, 1551
  - annual report on, 1047
  - curtailment of, especially regarding free choice of physicians, 414—E; (Council article) *696
  - experience with, [Robinson] *1630
  - resolution that A. M. A. encourage re-establishment of free choice principle, 2150
- MEDICINE
  - amphibious and Marine Corps Field, 1541
  - as profession, obligations, (President's page) 1020
  - Aviation Medicine: See Aviation
  - educational matters in fields related to, annual report, 1094

MEDICINE—Continued
federal medical-health spending for 1959, 1452
historical note on curriculum, 1461
history, award for exhibit, 903
hypnosis in, (Council report) 186
Internal: See Internal Medicine
Legal: See Medical Jurisprudence
meets with labor, report of conference, 289—E; 290
military, meeting on, Belgium, 307
Organized: See also American Medical Association; Societies, Medical; and under names of specific societies
organized, liaison with higher education, 1486
Practice: See also General Practice; Specialties; and under name of specialties as Pediatrics
practice, business of, [Business Practice] 1932
practice, clinical, contributions of doctor of physical medicine, [Blau] *1217
practice, clinical, related to public health: aging, and long-term illness, [Underwood] *1000
practice, excerpts from brochure on business side of, (Business Practice) 818; 935; 1155; 1262; 1401; 1691; 1806; 1932; 2050; 2176
practice, government-sponsored, A. M. A. resolution on, 70
practice, group, A. M. A. compiles list of, 1114; [Medicine at Work] 1367
practice, liaison with medical schools, 1232
practice, private, abstracts on absence from work and its relation to, (Council article) 1019—E; 1133
practice, restrictive effect of Board certification on, A. M. A. resolution on, 65
Preventive: See Preventive Medicine
psychological, in general practice, United Kingdom, 1573
sensationalism in, United Kingdom, 809
socialization of, proposed regionalization in Puerto Rico, A. M. A. resolutions on, 69
socialized, are we making same mistakes British doctors made? (Miscellany) 931
Space Medicine: See Aviation
third parties in, 70; 289—E; 290; (President's page) 416; (conference with) 1110; [Medicine at Work] 1366
MEDICINE AND THE LAW
"Man Who Didn't Walk," medicolegal film, 72
National Interprofessional Code for Physicians and Attorneys, 1663
tax deduction of professional entertainment expenses; opinions of Judicial Council, 1555
tort liability of charitable hospitals to patients, 788
MEDICINE AT WORK
various subjects, 769; 1363; 1891 (annual report) 1039
MEDICOLEGAL: See Medical Jurisprudence; Medicine and the Law; Medicolegal Abstracts at end of letter M
MEDITERRANEAN fever, familial, [Heller] 821—ab
MEDROL: See Methylprednisolone
MEGACOLON: See Colon
MEGAESOPHAGUS: See Esophagus
MEGAPHEN: See Chlorpromazine
MEGIMIDE: See Bemegride
MEIGS' SYNDROME
[Stavem] 1938—ab
MELANCHOLIA
treatment: iproniazid, toxicity of, 50—E; (reply) [Robie] 1802—C
MELANIN
pigmentation, Bloch-Sulzberger's disease, [Lamy] 1278—ab
MELANOMA (melanosarcoma)
malignant, combined surgical and radiotherapeutic approach, [Dickson] 352—ab
primary malignant, of oral cavity, 105 cases, [Chaudhry] 2325—ab
MÉNIÈRE'S *Disease: See Vertigo, aural*
MENINGES
method of therapy in
[Shvedova] 1717—ab
nd premature infants,
subdural hematoma in elderly person, [Stuteville & Welch] *1445
MENINGITIS
aseptic, [Wilt] 339—ab
aseptic, epidemic of exanthem with, [Tyrrell] 1410—ab
aseptic, epidemiology of and related nonspecific disease, 1957, [Dubin] 1291—ab
aseptic, with rubelliform rash, isolate ECHO virus from, [Sultanian] 132—ab
cryptococcal, promising results in, [Rubin] 1271—ab
staphylococcal, novobiocin for, [Giusti] 337—ab
tuberculous, corticosteroids in, India, 1392; (advantages and limitations) [Dieckmann] 1580—ab
tuberculous, hydrocortisone for, [Cranny] 1284—ab
tuberculous, in children, intracranial calcification after, [Lorber] 958—ab
treatment, exclude
Shvedova] 1717—ab
[Gehrt] 1945—ab
tuberculous, treatment, [Glova] 440—ab
virus, epidemic due to ECHO 9 virus in Newfoundland, [Davies] 1290—ab
IS
rtisone and ACTH in,
ection in infants and
41—ab
MENOPAUSE
icy cold nose and headaches in healthy woman going through, cause, 2084
myopathy of climacteric, [Kaeser] 1938—ab
MENSTRUATION
examine blood for tubercle bacilli in tuberculosis sanatorium, [Pickroth] 2070—ab
irregular, and sterility, in primary failure of anterior pituitary, cobalt radiation of value? 1732
premenstrual herpetic mouth lesion, (reply) [Houk] 844
premenstrual syndrome, France, 309
secondary amenorrhea and oligohypomenorrhea, incidence of spontaneous cure, [Westman] 2313—ab
MENTAL DEFICIENCY: See also Phenylketonuria
centers for children, first state-supported day care center in U. S., Del., 1909
child programs expand, 1913
children's colony at Conway, Ark., 908
etiology, 1422
associated with, [Willi-
Klinefelter's syndrome
[Prader] 2193—ab
200 cases reviewed, India, 1256
MENTAL DEPRESSION
atypical endogenous, vitamin B complex deficiency causing symptoms of, [Keuter] 1938—ab
treatment: iproniazid, toxicity of, 50—E; (reply) [Robie] 1802—C
M
lso Schizophrenic
" under Medico-
tter M
Mentally Ill accredited, Canada, 2282
riminally insane, facts
n, 98
Hospitals, mental
how contagious is mental illness?, [Medicine at Work] 773
isolation stress in, [Ziskind] *1427
Joint Commission on: See Joint Commission
search center at Saint
ashington, D. C., 2284
ited Kingdom, 2047
general hospitals,
71
in phenylketonuria,
surgical treatment of tuberculosis of lung in mentally ill, [Mowlem] 330—ab
symptoms in liver insufficiency, [Harvald] 216—ab
treatment: carbutamide, Sweden, 211
treatment: meprobamate, India, 2293
treatment: methylprednisolone, side-effects in, [McMahon & Gordon] *1208
treatment: perphenazine, Norway, 922
MENTAL HEALTH
A. M. A. Council on, annual report, 1052
in Industry, A. M. A. Joint Committee on, annual report, 1067
increase in USPHS grants in, 1671
Joint Commission on: See Joint Commission
programs, 29 state commissioners review, 2033
troubled employee; economic loss, community problem, medical challenge, (Medicine at Work) [Golin] 1371; 1377—E
workers, grants to aid, 1384
MEPACRINE: See Quinacrine
MEPHENTERMINE
[Wilson] 1944—ab
hers] *1839
[Haizlip] 337—ab
effects on brain damaged patients, [Carter] 337—ab
toxicity, idiosyncrasy, [Charkes] 2323—ab
treatment in psychiatry, (Finland) 308; (India) 2293
MERCAPTOPURINE
effects on acute leukemia in adult, [Kenis] 347—ab
MERCHANT MARINE: See Seamen
MERCURY
absorption and acrodynia relationship, 138
Diuretics: See Diuretics
vapor, acute poisoning from inhaling [Matthes] 2317—ab
MESCALINE
treatment (adjunctive) in alcoholism, [Smith] 2068—ab
MESONEPHROMA
of ovary, [Kay] 458—ab
METABOLISM: See also specific food groups or elements as Calcium, Carbohydrates
antimetabolites;
tal malforma
(Council artic
aspects of adrenalectomy in Cushing's syndrome, [Mason] 2308—ab
changes in normal pregnancy, (Council article) *[Macy]* *2265
effects of prednisone on; in rheumatoid arthritis [Ward] 836—ab
effects of rewarming after hypothermia, [Fisher] 839—ab
inborn error, hypophosphatasia, 415—E
phenylketonuria,
rednisone
Prednisolone
709
METHIONINE
effects on plasma lipids and atherogenesis in cholesterol-fed cockerels, [Stamler] 976—ab
METHOTREXATE: See 4-Amino-N^{10}methyl pteroylglutamic Acid
METHYL SALICYLATE
salicylate problem, [Cann] 1577—ab
METHYL VIOLET: See Methylrosaniline
β,β-METHYLETHYLGLUTARIMIDE: See Bemegride
METHYLPREDNISOLONE
treatment, side-effects noted, [McMahon & Gordon] *1208
(Brazil) 802;
See Prednisolone
METICORTEN: See Prednisone
METOQUIN: *See Quinacrine*
METYCAINE: See Piperocaine
MICROCOCCUS: See Staphylococcus
MICROSCOPY
electron and *light, correlate clinical findings* with morphology as seen by, in renal disease, [Vernier] 1942—ab
MICROWAVES
medical considerations of exposure to, [Barron & Baraff] *1194
MIDICEL: See Sulfamethoxypyridazine
MILIA, treatment, 2333
MILITARY
care, estimate costs for, 1662
medical activities, A. M. A. Committee annual report on, 1068
medicine, meeting on, Belgium, 307
physicians, compensation for, annual report on, 1068
physicians on active duty, A. M. A. liaison with, annual report, 1069
Preparedness: See Medical Preparedness
service, active, physicians separated from, (Council survey) 1904
veterinary corps, annual report on, *1069*
MILK
cow's, source of lactic acid bacilli in, 981
dried and fresh, utilization of *calcium from,* 844
dried skimmed, and kwashiorkor, [Pretorius] 223—ab
omit in infants diet for hereditary galactose disease, (Council report) [Guest] *2015
radioactivity in, report on, 914
MILTOWN: See Meprobamate
MINAMATA DISEASE
caused by eating contaminated fish, *United* Kingdom, 1683
MINERS
[Ruys] 963—ab
1720—ab
ne to A. M. A.,
ality *Inventory,*
aland, 433
MISSILES or pensions, (Miscellany) [Orr] *1686*
MISSING PERSONS: See also Federal Bureau of Investigation
wanted by Salt Lake County *(Utah)* Sheriff's Office: Richard Nunley, (photo) 1791
MITRAL VALVE
insufficiency, direct vision *correction of,* [Kay] 946—ab
insufficiency, pure, clinical and hemodynamic observations, [Ross] 823—ab
stenosis, digital and instrumental commissurotomy for, 2000 cases, [Dogliotti] 2309—ab
stenosis, extreme, operations in patients over 45, [Soulié] 1270—ab
stenosis, rheumatic carditis after commissurotomy for, [Golubev] 104—ab
surgery, commissurotomy, clinical *observations* and concepts on, [Huang] 447—ab
surgery, commissurotomy; 50 cases with no mortality, [Sabety] 1267—ab
surgery, emergency commissurotomy *in* intractable pulmonary edema, [Wessel & Webster] *1214

II, (rescinnamine): See Rauwolfia serpentina
MOLE: See Nevus
MONILIA
  injection abscess due to, [Eriksen] 837—ab
MONILIASIS
  gastric, [Tinajero Ayala] 940—ab
  vaginal, nystatin for, [Caruso] 957—ab
NUCLEOSIS, INFECTIOUS
  recurrence, followed or accompanied by infectious hepatitis? 2333
MONSTERS
  rate, origin of fetal malformations, [de Gennaro] 2313—ab
MORPHINE
  liberation of from codeine, [Pærregaard] 1721—ab
  pharmacological activity, India, 806
MOTHERS: See Families; Maternity
MOTION PICTURES: See Moving Pictures
MOTOR VEHICLES: See Automobiles
MOUTH
  bitter taste in, with fairly large hiatus hernia, cause, treatment, 136
  breathing, indication for adenoidectomy? 362
  buccal cancer, cobalt therapy, [Stuhl] 1821—ab
  buccal streptokinase, clinical and experimental observations, [Innerfield] 124—ab
  carcinomas, multicentric, [Moertel] 111—ab
  herpetic lesion prior to menstruation, (reply) [Houk] 844
  mycology, (United Kingdom) 2046; [Fox] 2302—ab
  oral diagnosis of systemic disease, [Hopp] *748
  poliomyelitis immune globulin (human) for herpetiform lesions, N. N. D., 183
  surgery during anticoagulant therapy, 2081
  tumors, primary malignant melanoma, 105 cases, [Chaudhry] 2325—ab
MOVEMENTS
  disorders, involuntary, globus pallidus and thalamic lesions in, [Cooper] 2067—ab
MOVING PICTURES
  A. M. A. annual reports, 1051; 1073
  A. M. A. film library, annual report on reviews, 1074
  "Annual Prize for Medico-Surgical Cinema," 2280
  film on careers in medicine and health fields, annual report, 1075
  film source file, annual report, 1075
  first annual Symposium on Cinefluorography, N. Y., 700
  international festivals, special committee to determine U. S. policy of participation in, 1075
  "Man Who Didn't Walk," medicolegal film, [Medicine and the Law] 72
  medicolegal film project, annual report, 1046
  Ralph Creer to organize and direct an international exhibition in Japan, 695
  special projects of medicolegal significance, annual report, 1044
OVING PICTURES, MEDICAL (REVIEWS)
  Assistive Devices for Paralyzed Upper Extremity, 938
  Bence-Jones Protein Test, 1935
  Biliary Duct Atresia, 1156
  Breech Delivery, 1402
  Career in Bacteriology, 1402
  Cheiloplasty: Correction of Harelip, 2178
  Clinic on Recognition and Management of Respiratory Acidosis, 2053; (illustrated review) [Smart & others] *2054
  Cystectomy for Ovarian Dermoids, 710
  Ectopia Cordis in a Twin, 1695
  Ergot, the Story of a Parasite Fungus, 938
  Femoral Artery Bypass Graft with Crimped Teflon, 1935
  For the Love of Life, 710
  From the Heart of Town, 1402
  Helping Hands for Julie, 1695
  Intracranial Aneurysms, 1935
  Life in a Cell, 2178
  Machine Mimics Man: The Artificial Kidney, 2297
  No Time to Spare, 938
  Operating Microscope in Otologic Surgery, 1935
  Psychiatric Nursing: Nurse-Patient Relationship, 1156
  Retropubic Prostatovesiculectomy, 2053
  Someone is Watching, 1695
  The Human Machine, 938
  This is Nursing, 1695
  Urethral Catheters, 938
  You Are There: Discovery of Anesthesia, 1402
MUCIN
  gastric, plasma-clearing effect in healthy and atherosclerotic subjects, [Rossi] 1699—ab
MUCOPROTEINS in Blood: See Blood
MUCORMYCOSIS
  cerebral, [Smith] 2200—ab
MUCOUS MEMBRANES
  oral, in diagnosis of systemic disease, [Hopp] *748
  Touraine's aphthosis, [Thibault] 943—ab
MUMPS (epidemic parotitis)
  complication: thrombopenic purpura, [Kolars & Spink] *2213
MUMPS—Continued
  in adults, treatment, 1295
  cortisone and
  b
MURDER
  by insulin, United Kingdom, 811
  first-degree, etiologic factors in, [Duncan & others] *1755
MUSCLES
  cramps, cause, treatment, relation to calcium intake, 2206
  degeneration, electromyography in diagnosis and appraisal of, as related to neurological and/or muscular cause, 1733
  electrical activity in infantile cerebrospastic paralysis, India, 92
  electromyogram to evaluate neurological complications of spinal anesthesia, [Marinacci & Courville] *1337
  gastrointestinal and striated, morphologic study of avitaminosis E in cystic fibrosis of pancreas, [Blanc] 2071—ab
  myopathy of climacteric, [Kaeser] 1938—ab
  respiratory, activity, effect of air flow resistance on, [Fink & others] *2215
  tone, evaluation of newborn infant, [Apgar & others] *1985
  weakness in infants and small children, examination for, [Johnson] *1306
MUSEUMS
  Bureau of Exhibits annual report on, 1075
  health, scholarships from, Ohio, 1141
MUSIC: See Physicians, avocations
MYASTHENIA GRAVIS
  after removal of cystic thymus, electrolytes during crisis, [Fongi] 456—ab
  blood cholinesterase and, after exposure to insecticides, (replies) [Trimble; and original consultant] 138
  in children, [Sampayo] 1282—ab
MYCIFRADIN; MYCIGUENT: See Neomycin
MYCOSIS: See also specific mycoses, as Mucormycosis
  of newborn, vaginitis in etiology, [Bret] 458—ab
MYCOSTATIN: See Nystatin
MYELOMA
  multiple, blood cholesterol-globulin complex in, [Schless] 128—ab
  multiple, natural history before radiological evidence, [Osserman] 1585—ab
  multiple, proteinic and hematological changes, [Prato] 215—ab; 216—ab
  multiple, Waldenström's macroglobulinemia resembling, [Hampton] 821—ab
MYELOSIS, erythremic: See under Anemia
MYLERAN: See Busulfan
MYOCARDITIS
  Coxsackie infection in infants and children, [Hosler] 1941—ab
  etiology: sulfonamides, Canada, 1922
  interstitial, primary, epidemic outbreak, [Freundlich] 832—ab
MYOCARDIUM
  consequences of coronary arterial occlusion in coronary atherosclerotic cardiopathy, [Himbert] 439—ab
  electrode to control complete heart block, with artificial pacemaker, [Weirich] 822—ab
  failure in toxemia of pregnancy, [Siliquini] 2191—ab; (correction) 2282
  implant internal mammary artery into, evaluation in animals, [Patt] 113—ab
  infarction, acute, anticoagulants for, [Richards] 439—ab; (long-term, United Kingdom) 924
  infarction, acute, (264 cases) [Malach] (experience with anticoagulants) [Rosenberg] 213—ab
  infarction, asystole in, cardiac pacemaker and intravenous isoproterenol for, [Solarz & others] *2124
  infarction, diagnostic aids in; [Durant] 322—ab
  infarction, digitalis and nitroglycerin for? 1297
  infarction, effect of competitive industrial activity on severely disabled after, [Slipyan] *147; 190—E
  infarction, elevated blood cholesterol level after, treatment, 844
  ities after nor-
  125—ab
  348—ab
  pulmonary hypertension, arteriosclerosis, pulmonary em*bolism and, (Diagnostic Problems) [Kushner* & Szanto] *277
  infarction in fetus, [Schuler] 1412—ab
  infarction, influence of anticoagulants on occurrence of cardiac rupture and hemopericardium after, [Aarseth; Lange] 1415—ab
  infarction, men who returned to work after, [Weiss & Weiss] *17
  infarction, postoperative, [Feruglio] 2059—ab
  infarction, rate by occupational group, [Biorck] 841—ab
  infarction, SGO-transaminase test in, [Chapin] 939—ab
MYOCARDIUM—Continued
  infarction, serum transaminase test in, calorimetric method, [Ciocia] 213—ab
  infarction, shock in, drugs for, (Council report) [Selzer & Rytand] *762
  infarction, Sweden, 2294
  infarction with ventricular fibrillation, successful resuscitation in, [Bloomfield] 330—ab
  infarcts, ruptured, histologic patterns, [Freeman] 318—ab
  revascularization, division of internal mammary arteries, for, [Glover] 329—ab
MYOPIA
  in children, dietary treatment, [Gardiner] 346—ab
  progressive, thyroid disorder or allergy as cause? 1837
MYOTONIA
  congenita, myxedema and pseudomyotonia, [Jarcho] 2058—ab
MYSOLINE: See Primidone
MYXEDEMA
  diagnosis, treatment, 983
  pseudomyotonia and myotonia congenita, [Jarcho] 2058—ab
  psychosis from, [Rullo & Allan] *890
  solitary pleural effusion due to, [Schneierson & Katz] *1003

Medicolegal Abstracts

INSANITY
  civil: commitment; affidavits of physicians as privileged, 320
  civil; commitment; physician appointed by court, 320
  civil; commitment; physician's liability for, 320
LIBEL AND SLANDER
  commitment proceedings; false affidavits; physician's liability, 320
  commitment proceedings; privilege of witness, 320
MALPRACTICE
  workmen's compensation in relation to, 320
WORKMEN'S COMPENSATION ACTS
  malpractice by physicians: liability for, 320

N

NADISAN (carbutamide): See Sulfonylureas
NAILS (anatomic)
  changes in alopecia universalis, 1837
  splinter hemorrhages, United Kingdom, 315
  subungual hemorrhage in pan washers, [Long] *1226
NAPHTHALENE
  "scrap iron" intoxication, [Gadsden & others] *1220
NARCOTICS
  addiction, annual report, 1053
  department, report, India, 921
  withdrawal symptoms in newborn infants, [Kunstadter & others] *1008
NATIONAL (societies): See also Societies and other Organizations at end of letter S
  Committee on Aging of National Social Welfare Assembly, annual report, 1103
  Defense: See Civil Defense; Medical Preparedness
  Emergency Medical Care Plan, Commission on, annual report, 1071
  Fund for Medical Education: See Foundations
  Institutes of Health, Nobel Prize winners associated with research supported by, 1915
  Intern Matching Program, 525; 1092
  Interprofessional Code for Physicians and Attorneys, 1661—E; [Medicine and the Law] 1663
  Joint Commission for Improvement of Care of Patient, (recommends individual hospitals form committees) 52; (report) [Medicine at Work] 1894
  Medical Defense Conference: See Civil Defense
  Research Council's postdoctoral fellowships, survey, 1478
  Science Fair: See Science
  Science Foundation: See Foundations
  Society for Medical Research, (function of) 1489; (supports animal care meeting) 1662
NATIONAL HEALTH SERVICE (England)
  American looks at, 317
  are we making same mistakes British doctors made? British GP thinks so, (Miscellany) 931
  cost of, 810; (cutting costs) 2174
  failed to eliminate voluntary health insurance, [Follmann] *1641
  general practice in, 314
  health levy, 1396
  hearing on, 312
  hospital beds still scarce, 97
  hospital's spending criticized, 927
  merit awards for general practitioners, 98
  "On Call to a Nation," radio celebrated 10th anniversary, 2296
  painting depicts, 435
  pay increase to physicians refused, 98

NATIONAL HEALTH SERVICE—Continued
  pharmacists' remuneration, 927
  politics and, 2047
  proposed restriction on prescribing, 709
NAVY, UNITED STATES
  establish course in nuclear nursing, 914
  medical corps retirements, 1247; 1671
  physicians from 12 nations attend training program, 914
  Reserve, ensign 1915 program, 1537
  Surgeon General Hogan receives Peruvian Cross of Merit, 1915
NAZI camp doctor, action on, United Kingdom, 97
NECK
  palpable cervical lymph nodes, [Sage] *496
NEEDLES
  plastic, for spontaneous pneumothorax, [Knuth & others] *177
  used for spinal anesthesia, effects of detergents left as contaminants in, [Joseph & Denson] *1330
  whiplash injuries; neurophysiological basis for pain, rehabilitation methods, [Seletz] *1750
  within calyces, foreign body in kidney, [Naulleau] 344—ab
NEEDY: See Medically Indigent
NEGROES
  homozygous hemoglobin C disease in, [Tanaka] 438—ab
  Pelizaeus-Merzbacher disease in, [Tyler] 1270—ab
NEOMYCIN
  toxicity: deafness caused by intramuscular use, [Kortge-Stoppler] 1285—ab
  treatment, intraperitoneal, in acute bacterial peritonitis, [Greene] 1288—ab
  treatment plus sulfadimidin in infant diarrhea, India, 1256
NEOPLASMS: See also Cancer; Sarcoma; Tumors; under region or organ affected.
  metastatic, skeletal, activation of patient with, [Cummings & Rosenthal] *501
NEOTEBEN: See Isoniazid
NEPHRITIS
  acute atypical, clinical observations, [Hansen] 1415—ab
  acute glomerular, in children, India, 2043
  after poliomyelitis vaccination related to? 360
  in childhood, Norway, 310
NEPHROBLASTOMA
  neuroblastomas and, [Nordøy] 1818—ab
NEPHROSIS; NEPHROTIC SYNDROME: See Kidneys, disease
NERVES
  cranial, neurofibrosarcoma of, [Economou] 951—ab
  damage in whiplash injuries, [Seletz] *1750
  optic atrophy, hereditary, [Iverson] 345—ab
  optic gliomas, [Dodge] 336—ab
  vagotomy with gastric resection for peptic ulcer, long-term results, [Pallette & Harrington] *20
NERVOUS SYSTEM
  abnormalities in Refsum's syndrome, United Kingdom, 927
  central, paragonimiasis, [Shih] 1713—ab
  complications of pertussis immunization, [Berg] 1280—ab
  complications of spinal anesthesia, electromyogram to evaluate, [Marinacci & Courville] *1337
  disability, activation of patient with skeletal metastatic neoplasia, [Cummings & Rosenthal] *501
  disease after Asian influenza compared to 1918 influenza epidemic, 2332
  disorder, minamata disease, United Kingdom, 1683
  disorders after Asian influenza, [Horner] 118—ab; [McConkey] 954—ab
  disorders in industry, A. M. A. Committee on, first meeting, 1066
  electromyography in diagnosis and appraisal of muscular degeneration as related to neurological cause, 1733
  involvement in cryptococcosis, [Pelaez] 321—ab
  lesions, anatomoclinical study of fetal deaths, [Chosson] 119—ab
  severe manifestations in children receiving Compazine, [Jabbour] 1581—ab
  strain, the physician himself, [McArthur] *1740
  study of botulism, [Castedo] 2303—ab
  surgery, aspects of hypophysectomy in severe diabetes, [Javid] 1814—ab
  surgery, care of severely injured patient, [Odom] *2087
  surgery, report of American Academy of Neurological Surgery, Canada, 2292
NERVOUS SYSTEM, SYMPATHETIC
  blocks in orthopedic surgery, [Brennan] *504
  tumors, ganglioneuroma of cervical system, [Smyth] 447—ab
NEURALGIA
  trigeminal, alcohol gasserian injection for, [Ecker] 119—ab
  trigeminal, treatment, [Ruge] 1705—ab
NEURAMINIC ACID
  in cerebrospinal fluid, deficiency in schizophrenia, •[Bogoch] 1411—ab
NEURITIS
  of recurrent laryngeal nerve, incidence, treatment, 2329
  peripheral, pyridoxine to prevent after isoniazid, [Ross] *273; (reply) [Middlebrook] 1685—C
  polyneuritis, after intradermal Asian influenza vaccine, (replies) [Steigman; and original consultant] 2086
NEUROBLASTOMA
  nephroblastomas and, [Nordøy] 1818—ab
NEURODERMATITIS
  disseminata, long-term prednisone in, [Kanee] 1812—ab
NEUROFIBROMATOSIS
  Brazil, 430
NEUROFIBROSARCOMA: See Fibrosarcoma
NEUROLOGY
  exchange mission to Soviet Union, 2284
  National Neurological Research Foundation awards, 1143
NEUROSIS
  cardiac, patient and physician in symptom formation, [Chambers & others] *1617
  internal medicine and, Portugal, 211
  symptoms in liver insufficiency, [Harvald] 216—ab
  traumatic, "Man Who Didn't Walk," medicolegal film, [Medicine and the Law] 72
NEUROSYPHILIS
  clinical and serological state of 416 well treated patients, long-term observation, [Kalz] 1413—ab
NEUROTROPISM
  neurotrophic ulcers of feet, [Kelly & Coventry] *388
NEUTROPENIA: See Granulocytopenia
NEVUS
  pigmented, multiple, in 12-year-old, treatment, 473
  spider, and liver disease, India, 1925
NEW ENGLAND
  medical-dental education plan, 1488
NEW YORK UNIVERSITY
  Bellevue Medical Center, institute for rheumatic fever established at, 2278
  center for rehabilitation services, 295
  Institute for Crippled and Disabled joint rehabilitation research, 1560
NEW ZEALAND
  welfare state down under, (Miscellany) [Hotchkiss] 933
NEWSPAPERS: See Press
NIADRIN: See Isoniazid
NICKEL
  desensitization method, 1731
NICONYL: See Isoniazid
NICOTINIC ACID
  in hypercholesteremia, N. N. D., 1773
NICOZIDE: See Isoniazid
NITROGEN DIOXIDE
  inhalation causes chronic silo filler's disease, [Schell] 963—ab
NITROGEN MUSTARDS
  treatment of Hodgkin's disease, [Moschidis] 959—ab
NITROGLYCERIN: See Glyceryl Trinitrate
NOISE
  abatement in hospitals, United Kingdom, 312
  is it a health problem? [Glorig & Summerfield] *370
  tractor, effect on auditory sensitivity of operators, [Lierle] 1721—ab
NOMENCLATURE: See Terminology
NORADRENALINE; Norepinephrine: See Arternol
NOSE
  discharge during eating after contrecoup brain damage; cause, treatment, 2081
  icy cold, in healthy woman going through menopause, cause, 2084
NOVOBIOCIN
  treatment of staphylococcal meningitis, [Giusti] 337—ab
NOVOCAIN: See Procaine
NUCLEAR ENERGY: See Atomic Energy
NUCLEUS
  pulposus, herniation of, Denmark, 208
NUNLEY, RICHARD, missing person wanted by Salt Lake County Sheriff's Office, (photo) 1791
NUPERCAINE: See Dibucaine
NURSERY: See Hospitals, nurseries
NURSES AND NURSING
  American Nursing Home Association—A. M. A. Liaison Committee, annual report, 1115
  nasal carriage of Staphylococcus aureus by nurses, [Thompson] 969—ab
  Navy course in nuclear nursing established, 914
  nurse shortage, Sweden, 1801
  nurses' working hours, dilemma of hospitals, United Kingdom, 808
  nursing homes, annual report, 1103
  nursing routine challenged, United Kingdom, 2049
NURSES AND NURSING—Continued
  operating room training of students, A. M. A. resolution on, 68
  schools, accreditation program for, report on, 58
  streptomycin dermatitis in nurses, [Wilson] 465—ab
NUTRITION
  A. M. A. Council annual report, 1057
  blood cholesterol level and, [Picchio] 131—ab
  blood proteins and, India, 92
  clinical research fellowships, (Council announcement) 768
  clinical, symposiums on, annual report, 1058
  French Nestlé Company's fellowship, 78
  infant and maternal, Vanderbilt study; effect of reproductive cycle on status and requirements, (Council article) [McGanity & others] *2138
  maternal, and fetus, (Council article) [Hepner] *1774
  research, grants for, 78
  state of mother prior to conception, (Council article) [Stearns] *1655
NYDRAZID: See Isoniazid
NYLON
  alopecia, United Kingdom, 1928
  bifurcation grafts in arteriosclerosis, [Hill] 2309—ab
  braided, in arterial bypass surgery, comparison with homografts, [Hohf] 2305—ab
  brush, [Savill] 2319—ab
  crimped, peripheral arterial grafts of, [Edwards] 452—ab
  sensitivity, desensitization possible? 1295
  tapes, self-adhering, [Gershman] 930—C
NYSTATIN
  treatment of vaginal moniliasis, [Caruso] 957—ab

O

OBESITY
  causes of, United Kingdom, 96
  fatty acids and diets for, United Kingdom, 2046
  in young child, treatment, 1167
  peroneal paralysis, hazard in weight reduction, [Sprofkin] 826—ab
  role of salt in fall of blood pressure accompanying reduction in, [Dahl] 322—ab
  skin absorption of calories, 1169
OBITUARIES: See Physicians, death; and list of Deaths at end of letter D
OBSTETRICS
  physiological basis for hormone therapy in, [de Alvarez & Smith] *489
  promethazine in, [Carroll & Moir] *2218
  regional anesthesia, reappraisal, [Bonica] *734
  World Congress of, Canada, 89
OCCUPATIONAL Dermatoses; Diseases, Health, etc.: See under Industrial
OCCUPATIONAL THERAPY
  India, 922
  schools of, 1545
OCEAN
  swimmer's itch and possible schistosomiasis from swimming in, (replies) [Schaefer; and original consultant] 1838
ODOR: See also Deodorants
  bromhidrosis, etiology, 1592
OFFICE: See Physicians
OIDIUM (Candida) albicans Infection: See Monilia; Moniliasis
OIL
  dietary, effect on bile-acid secretion and serum cholesterol, [Lewis] 131—ab
  ethereal, with streptomycin for pulmonary diseases, [Liener] 468—ab
  vegetable, substitute for animal fat to lower blood lipids, [Brown & Page] *1989
OLD AGE
  aging division and senior center established by Bergen County, New Jersey, 2030
  A. M. A. Committee on Aging, annual report, 1101
  anticoagulant therapy to prevent cerebral thrombosis after one attack in? 1593
  Ciba Foundation awards for research in aging, 77
  clinico-instrumental techniques and serum analysis of presenile and senile patients with cardio-aortic atherosclerosis, [Roselli] 970—ab
  coarctation repair with relief of hypertension in man 57, [Kittle & others] *2006
  conference calls for medical society action on aging, [Medicine at Work] 769; 779-E; 1102
  conferences on aging, letter from Dr. Blasingame to U. S. Senate, 695
  congestive heart failure in 46-year-old-woman, (Diagnostic Problems) [Kushner & Szanto] *277
  dissolving corneal opacities in diabetic, 138; (reply) [Mann] 1838
  emphysema and lungs in, [Mayer] 1810—ab

AGE—Continued
  fees, insurance, A. M. A. meeting report, 2148
  homes for aged, United Kingdom, 1395
  hyperthyroidism in, treatment, 1835
  Joint Council to Improve the Health Care of the Aged, A. M. A. resolution on voluntary health insurance, 65; 68; (report) 1102
  meprobamate addiction, [Boyd & others] *1839
  mortality among centenarians, Pa., 701
  National Committee on Aging of National Social Welfare Assembly, report on, 1103
  ocular senescence, Belgium, 2290
  operations for extreme mitral stenosis in, [Soulié] 1270—ab
  outlook of vascular surgery in, [Hitchcock] 1267—ab
  peptic ulcer after 60, clinical patterns, [Cutler] 419—ab
  positive health program for, proceedings available, (Council note) 1551
  problems related to public health, clinical practice and, [Underwood] *1000
  provide voluntary health insurance for retired persons, (Bureau article) [Polner] *191
  public aspects of aging population, WHO report, 928
  relation between condition of limbs and capacity for work, Denmark, 208
  Social Security Benefits: See Forand Bill
  subdural hematoma in, [Stuteville & Welch] *1445
  Suggested Guides for Organization and Operation of Medical Society Committees on Aging approved, 59
  treatment of psychiatric patients with carbutamide, Sweden, 211
  lymph-node in-
  110—ab
  phosphate, N. N. D., 1011
  ruation
  See
  Phenylketonuria
OLIVE pollen sensitivity, Israel, 2014
OPERATING ROOM: See Surgery
OPERATION: See Surgery; under names of specific organ and disease
OPHTHALMOLOGY
  Association for Research in, annual report on, 1073
  fellowship winners, 298
OPTOMETRISTS
  commissioning by Armed Forces, annual report on, 1068
  want amendment to Social Security Act, 2 letters from Dr. Blasingame to Congress regarding, 291
ORABETIC; ORANIL (carbutamide): See Sulfonylureas
ORCHESTRA: See Physicians, avocations
ORCHITIS: See Testes inflammation
ORF
  4 cases in human beings, United Kingdom, 313
ORGAN, modern, playing, [Leisure Corner] 815; (reply) [Shull] 2297—C
ORIENT, degenerative cardiovascular disease in, [Schroeder] 1697—ab
ORINASE (tolbutamide): See Sulfonylureas
ORISUL: See *p*-Amino-benzolsulfonamidophenyl-pyrazol
ORPHENADRINE HYDROCHLORIDE
  treatment of Parkinsonism, Denmark, 208
ORTHOPEDICS
  use of sympathetic blocks in, [Brennan] *504
OSTEOARTHROPATHY
  hypertrophic pulmonary, absence in tuberculosis of lung, [Skorneck] 108—ab
  in smallpox, India, 1255
OSTEOLYSIS
  massive, [Johnson] 971—ab
OSTEOMYELITIS
  chronic, spiramycin for, [Marchis] 126—ab
  hypovitaminosis C and, in children, [della Casa] 1819—ab
OSTEOMYELOSCLEROSIS
  [Levi] 110—ab
OSTEOPATHY
  A. M. A. disapproved resolution on sovereignty of relationships between medical societies and, 2150
OSTEOPOROSIS
  ulcerative colitis and, unusual features, 1426
OSTEOSARCOMA
  trauma related to cause or aggravation of, 135
OTALGIA
  with esophageal hiatus hernia, [Malherbe] 952—ab
OTITIS MEDIA
  in nurslings after BCG vaccination, [Soboleva] 464—ab
  treatment: antibiotics, United Kingdom, 2049
OUTPATIENT DEPARTMENT
  pastoral counseling in medical center, [Young & Patrick] *21
OVARY
  activity, vaginal cytology to study, India, 2041
  cancer, mesonephric carcinomas, [Kay] 458—ab
  cancer, radioactive gold for, WHO report, 1397
  cystadenocarcinoma, and uterine pregnancy, [Chávez] 2315—ab
  cysts, progesterone for, 1294
  excision in breast cancer, correlate results with estrogen production, [Bulbrook] 917—ab
  excision plus adrenalectomy in metastasizing mammary cancer, [Hellström] 829—ab; [Davis] 2306—ab
  function, preserved in treatment of early cancer of cervix uteri in young women, [Krebs] 1939—ab
OVIDUCTS
  acute salpingitis, views on prognosis and treatment, [Hedberg] 1162—ab
  surgical management of tubal factor in infertility, [Cauwet] *991
  tuberculous salpingitis, treatment, [Rydén] 1161—ab
OXAMYCIN: See Cycloserine
OXYGEN
  deficiency, anoxia and hypoxia, new facts about the heart, (reply) [Hyman] 1154—C
  deficiency of abnormal physiologic origin as final common pathway in gastroduodenal ulcer genesis, [Palmer] 105—ab
  15, in study of pulmonary malfunction, WHO report, 1396
  hazards of therapy in respiratory disease, [Sherman] *1866
  manual and mechanical control of ventilation during cyclopropane anesthesia, [Wester & others] *2219
OXYGENATOR PUMP (mechanical heart)
  direct coronary artery perfusion for aortic valve surgery, [Kay & others] *1767
  extracorporeal circulation, 44 interventions with opened heart under, [Dubost] 1160—ab
  immediate postoperative period following total body perfusion, [Matthews] 1708—ab
OXYTETRACYCLINE
  treatment (intraperitoneal) in diffuse bacterial peritonitis in childhood, [Soave] 965—ab
  treatment (intraperitoneal) in peritonitis of appendical origin, [Adwan] 332—ab
  vs. silver nitrate in newborn eyes, incidence of conjunctivitis after, [Mathieu] 121—ab
OXYTOCIN
  hormone which inactivates, Austria, 2040

P

PAS: See Aminosalicylic Acid
PACEMAKER: See under Heart
PAIN
  abdominal, generalized, and acute renal failure, (Diagnostic Problems) [Kushner & Szanto] *1778
  abdominal, upper, esophagitis causes, [Bernstein & others] *27
  activation of patient with skeletal metastatic
  osenthal] *501
  disease, [Braun
  chest, of colon origin, [Palmer] 1702—ab
  factor in syncope in healthy young adults, [Dermksian & Lamb] *1200
  generalized congenital analgesia, [Lamy] 464—ab
  in diagnosis of peripheral arterial emboli, [Phelan & Young] *1299
  in tongue in multiple sclerosis, treatment, 843
  , in whiplash in-
  *1864
  nilateral, diagno-
  years after crush-
  ing injury, treatment, 1956
PALATE
  cleft, in second generation, prevent defect in
PAMISYL: See Aminosalicylic Acid
PAN washers, subungual hemorrhage in, [Long] *1226
PANCREAS
  abscess, gas as sign of, [Agnos] 944—ab
  cancer, clinical study, [Birnbaum] 324—ab
  cancer, diagnosis, (exfoliative cytology, rapid method of duodenal intubation) [Raskin] 440—ab; (secretin test) [Wenger] 441—ab
  cancer, radiation therapy in, [Billingsley] 1725—ab
  cystic fibrosis, Austria, 1797
PANCREAS—Continued
  cystic fibrosis, avitaminosis E in; morphology of gastrointestinal and striated muscle, [Blanc] 2071—ab
  cystic fibrosis, long-term study of 105 cases, [Shwachman] 832—ab
  cystic fibrosis, rectal prolapse in, [Kulczycki] 1699—ab
  disease, clinical evaluation of starch tolerance test, [Nugent & Millhon] *2260
  hypoglycemic sulfonamides show selective tropism for, France, 803
  infarcts, [McKay] 2179—ab
  insulin-producing capacity of diabetic children, [Klein] 1718—ab
  pseudocyst, clinical and surgical aspects, 58 cases, [Waugh] 451—ab
  retrograde surgical drainage for chronic relapsing pancreatitis, [Puestow] 217—ab
PANCREATITIS
  acute, and hyperdiastasuria after partial gastrectomy, [Wallensten] 1708—ab
  acute, atypical symptom-sign complex of, [Donhauser] 446—ab
  acute, Brazil, 2041
  acute, generalized abdominal pain and acute renal failure, (Diagnostic Problems) [Kushner & Szanto] *1778
  chronic relapsing, retrograde surgical drainage of pancreas for, [Puestow] 217—ab
PANCYTOPENIA: See under Anemia
PANEL
  advisory, and expert witness, [Sadusk] *2121
PANEMAX: See Papain
PANMYCIN: See Tetracycline
PAPAIN
  Panemax in treatment of strongyloidiasis, (Brazil) 802; [Asfora] 1703—ab
PAPILLOMA
  of large intestine, 967—ab
  : See Amino-
  of central nervous system, [Shih] 1713—ab
PARALYSIS
  agitans, chemopallidectomy for, 2 years' experience, [Paxton & Dow] *755
  agitans, excessive salivation in, treatment, 138
  agitans, globus pallidus and thalamic lesions in, basal ganglia surgery for, [Cooper] 2067—ab
  agitans, is it communicable? 1594
  agitans, orphenadrine for, Denmark, 208
  agitans, surgery for, symposium on, (reply) [Krusen & Ellwood] 319—C
  rthrodesis of sub-
  Dodelin] *1005
  relation to prema-
  831—ab
  neurological com-
  thesia, [Marinacci
  myelitis
  ctrical activity of
  peroneal, hazard of weight reduction, [Sprofkin] 826—ab
  respiratory, acute intermittent porphyria with, [Doll & others] *1973
  respiratory, long-term, rehabilitation in, [Neu] *1610
PARAMYOTONIA CONGENITA
  [Drager] 828—ab
PARANOIA: See Psychosis, paranoia
PARA-PAS; PARASAL: See Aminosalicylic Acid
PARAPLEGIA
  after spinal anesthesia, [Joseph & Denson] *1330
PARATHYROID
  crisis, cause of sudden death, [Hewson] 1157—ab
  idiopathic hypoparathyroidism, [Halvorsen] 1157—ab
  primary chief-cell hyperplasia of, new entity surgery of hyperparathyroidism, [Cope] 2186—ab
PARENTS: See Families
PARENZYME: See Trypsin
PARESTHESIA
  diagnosis of peripheral arterial emboli, [Phelan & Young] *1299
PARKINSONISM: See Paralysis agitans
PAROTID GLAND
  swelling, intermittent, due to ill-fitting dentures, [Furstenberg] 1579—ab
PAROTITIS, EPIDEMIC: See Mumps
PASTORS: See Religion
PATHOGENS in tobacco, 363
PATHOLOGY
  imens, 134
  te, "what is cause
  *161; (reply)
PATIENTS
  care, 5 health groups aim: improve, [Medicine at Work] 1894
  Chronically Ill: See Disease, chronic
  ethical to disclose case history to insurance company? (Judicial Council opinion on) 1556

NATIONAL HEALTH SERVICE—Continued
  pharmacists' remuneration, 927
  politics and, 2047
  proposed restriction on prescribing, 709
NAVY, UNITED STATES
  establish course in nuclear nursing, 914
  medical corps retirements, 1247: 1671
  physicians from 12 nations attend training program, 914
  Reserve, ensign 1915 program, 1537
  Surgeon General Hogan receives Peruvian Cross of Merit, 1915
NAZI camp doctor, action on, United Kingdom, 97
NECK
  palpable cervical lymph nodes, [Sage] *496
NEEDLES
  plastic, for spontaneous pneumothorax, [Knuth & others] *177
  used for spinal anesthesia, effects of detergents left as contaminants in, [Joseph & Denson] *1330
  whiplash injuries: neurophysiological basis for pain, rehabilitation methods, [Seletz] *1750
  within calyces, foreign body in kidney, [Naulleau] 344—ab
NEEDY: See Medically Indigent
NEGROES
  homozygous hemoglobin C disease in, [Tanaka] 438—ab
  Pelizaeus-Merzbacher disease in, [Tyler] 1270—ab
NEOMYCIN
  toxicity: deafness caused by intramuscular use, [Kortge-Stoppler] 1285—ab
  treatment, intraperitoneal, in acute bacterial peritonitis, [Greene] 1288—ab
  treatment plus sulfadimidin in infant diarrhea, India, 1256
NEOPLASMS: See also Cancer; Sarcoma; Tumors; under region or organ affected.
  metastatic, skeletal, activation of patient with, [Cummings & Rosenthal] *501
NEOTEBEN: See Isoniazid
NEPHRITIS
  acute atypical, clinical observations, [Hansen] 1415—ab
  acute glomerular, in children, India, 2043
  after poliomyelitis vaccination related to? 360
  in childhood, Norway, 310
NEPHROBLASTOMA
  neuroblastomas and, [Nordøy] 1818—ab
NEPHROSIS: NEPHROTIC SYNDROME: See Kidneys, disease
NERVES
  cranial, neurofibrosarcoma of, [Economou] 951—ab
  damage in whiplash injuries, [Seletz] *1750
  optic atrophy, hereditary, [Iverson] 345—ab
  optic gliomas, [Dodge] 336—ab
  vagotomy with gastric resection for peptic ulcer, long-term results, [Pallette & Harrington] *20
NERVOUS SYSTEM
  abnormalities in Refsum's syndrome, United Kingdom, 927
  central, paragonimiasis, [Shih] 1713—ab
  complications of pertussis immunization, [Berg] 1280—ab
  complications of spinal anesthesia, electromyogram to evaluate, [Marinacci & Courville] *1337
  disability, activation of patient with skeletal metastatic neoplasia, [Cummings & Rosenthal] *501
  disease after Asian influenza compared to 1918 influenza epidemic, 2332
  disorder, minamata disease, United Kingdom, 1683
  disorders after Asian influenza, [Horner] 118—ab; [McConkey] 954—ab
  disorders in industry, A. M. A. Committee on, first meeting, 1066
  electromyography in diagnosis and appraisal of muscular degeneration as related to neurological cause, 1733
  involvement in cryptococcosis, [Pelaez] 321—ab
  lesions, anatomoclinical study of fetal deaths, [Chosson] 119—ab
  severe manifestations in children receiving Compazine, [Jabbour] 1581—ab
  strain, the physician himself, [McArthur] *1740
  study of botulism, [Castedo] 2303—ab
  surgery, aspects of hypophysectomy in severe diabetes, [Javid] 1814—ab
  surgery, care of severely injured patient, [Odom] *2087
  surgery, report of American Academy of Neurological Surgery, Canada, 2292
NERVOUS SYSTEM, SYMPATHETIC
  blocks in orthopedic surgery, [Brennan] *504
  tumors, ganglioneuroma of cervical system, [Smyth] 447—ab
NEURALGIA
  trigeminal, alcohol gasserian injection for, [Ecker] 119—ab
  trigeminal, treatment, [Ruge] 1705—ab
NEURAMINIC ACID
  in cerebrospinal fluid, deficiency in schizophrenia, [Bogoch] 1411—ab
NEURITIS
  of recurrent laryngeal nerve, incidence, treatment, 2329
  peripheral, pyridoxine to prevent after isoniazid, [Ross] *273; (reply) [Middlebrook] 1685—C
  polyneuritis, after intradermal Asian influenza vaccine, (replies) [Steigman; and original consultant] 2086
NEUROBLASTOMA
  nephroblastomas and, [Nordøy] 1818—ab
NEURODERMATITIS
  disseminata, long-term prednisone in, [Kance] 1812—ab
NEUROFIBROMATOSIS
  Brazil, 130
NEUROFIBROSARCOMA: See Fibrosarcoma
NEUROLOGY
  exchange mission to Soviet Union, 2284
  National Neurological Research Foundation awards, 1143
NEUROSIS
  cardiac, patient and physician in symptom formation, [Chambers & others] *1617
  internal medicine and, Portugal, 211
  symptoms in liver insufficiency, [Harvald] 216—ab
  traumatic, "Man Who Didn't Walk," medicolegal film, [Medicine and the Law] 72
NEUROSYPHILIS
  clinical and serological state of 416 well treated patients, long-term observation, [Kalz] 1413—ab
NEUROTROPISM
  neurotrophic ulcers of feet, [Kelly & Coventry] *388
NEUTROPENIA: See Granulocytopenia
NEVUS
  pigmented, multiple, in 12-year-old, treatment, 473
  spider, and liver disease, India, 1925
NEW ENGLAND
  medical-dental education plan, 1488
NEW YORK UNIVERSITY
  Bellevue Medical Center, institute for rheumatic fever established at, 2278
  center for rehabilitation services, 295
  Institute for Crippled and Disabled joint rehabilitation research, 1560
NEW ZEALAND
  welfare state down under, (Miscellany) [Hotchkiss] 933
NEWSPAPERS: See Press
NIADRIN: See Isoniazid
NICKEL
  desensitization method, 1731
NICONYL: See Isoniazid
NICOTINIC ACID
  in hypercholesteremia, N. N. D., 1773
NICOZIDE: See Isoniazid
NITROGEN DIOXIDE
  inhalation causes chronic silo filler's disease, [Schell] 963—ab
NITROGEN MUSTARDS
  treatment of Hodgkin's disease, [Moschidis] 959—ab
NITROGLYCERIN: See Glyceryl Trinitrate
NOISE
  abatement in hospitals, United Kingdom, 312
  is it a health problem? [Glorig & Summerfield] *370
  tractor, effect on auditory sensitivity of operators, [Lierle] 1721—ab
NOMENCLATURE: See Terminology
NORADRENALINE; Norepinephrine: See Arternol
NOSE
  discharge during eating after contrecoup brain damage; cause, treatment, 2081
  icy cold, in healthy woman going through menopause, cause, 2084
NOVOBIOCIN
  treatment of staphylococcal meningitis, [Giusti] 337—ab
NOVOCAIN: See Procaine
NUCLEAR ENERGY: See Atomic Energy
NUCLEUS
  pulposus, herniation of, Denmark, 208
NUNLEY, RICHARD, missing person wanted by Salt Lake County Sheriff's Office, (photo) 1791
NUPERCAINE: See Dibucaine
NURSERY: See Hospitals, nurseries
NURSES AND NURSING
  American Nursing Home Association—A. M. A. Liaison Committee, annual report, 1115
  nasal carriage of Staphylococcus aureus by nurses, [Thompson] 969—ab
  Navy course in nuclear nursing established, 914
  nurse shortage, Sweden, 1801
  nurses' working hours, dilemma of hospitals, United Kingdom, 808
  nursing homes, annual report, 1103
  nursing routine challenged, United Kingdom, 2049
NURSES AND NURSING—Continued
  operating room training of students, A. M. A. resolution on, 68
  schools, accreditation program for, report on, 58
  streptomycin dermatitis in nurses, [Wilson] 465—ab
NUTRITION
  A. M. A. Council annual report, 1057
  blood cholesterol level and, [Picchio] 131—ab
  blood proteins and, India, 92
  clinical research fellowships, (Council announcement) 768
  clinical, symposiums on, annual report, 1058
  French Nestlé Company's fellowship, 78
  infant and maternal, Vanderbilt study; effect of reproductive cycle on status and requirements, (Council article) [McGanity & others] *2138
  maternal, and fetus, (Council article) [Hepner] *1774
  research, grants for, 78
  state of mother prior to conception, (Council article) [Stearns] *1655
NYDRAZID: See Isoniazid
NYLON
  alopecia, United Kingdom, 1928
  bifurcation grafts in arteriosclerosis, [Hill] 2309—ab
  braided, in arterial bypass surgery, comparison with homografts, [Hohf] 2305—ab
  brush, [Savill] 2319—ab
  crimped, peripheral arterial grafts of, [Edwards] 452—ab
  sensitivity, desensitization possible? 1295
  tapes, self-adhering, [Gershman] 930—C
NYSTATIN
  treatment of vaginal moniliasis, [Caruso] 957—ab

O

OBESITY
  causes of, United Kingdom, 96
  fatty acids and diets for, United Kingdom, 2046
  in young child, treatment, 1167
  peroneal paralysis, hazard in weight reduction, [Sprofkin] 826—ab
  role of salt in fall of blood pressure accompanying reduction in, [Dahl] 322—ab
  skin absorption of calories, 1169
OBITUARIES: See Physicians, death; and list of Deaths at end of letter D
OBSTETRICS
  physiological basis for hormone therapy in, [de Alvarez & Smith] *489
  promethazine in, [Carroll & Moir] *2218
  regional anesthesia, reappraisal, [Bonica] *734
  World Congress of, Canada, 89
OCCUPATIONAL Dermatoses; Diseases, Health, etc.: See under Industrial
OCCUPATIONAL THERAPY
  India, 922
  schools of, 1545
OCEAN
  swimmer's itch and possible schistosomiasis from swimming in, (replies) [Schaefer; and original consultant] 1838
ODOR: See also Deodorants
  bromhidrosis, etiology, 1592
OFFICE: See Physicians
OIDIUM (Candida) albicans Infection: See Monilia; Moniliasis
OIL
  dietary, effect on bile-acid secretion and serum cholesterol, [Lewis] 131—ab
  ethereal, with streptomycin for pulmonary diseases, [Liener] 468—ab
  vegetable, substitute for animal fat to lower blood lipids, [Brown & Page] *1989
OLD AGE
  aging division and senior center established by Bergen County, New Jersey, 2030
  A. M. A. Committee on Aging, annual report, 1101
  anticoagulant therapy to prevent cerebral thrombosis after one attack in? 1593
  Ciba Foundation awards for research in aging, 77
  clinico-instrumental techniques and serum analysis of presenile and senile patients with cardio-aortic atherosclerosis, [Roselli] 970—ab
  coarctation repair with relief of hypertension in man 57, [Kittle & others] *2006
  conference calls for medical society action on aging, [Medicine at Work] 769; 779-E; 1102
  conferences on aging, letter from Dr. Blasingame to U. S. Senate, 695
  congestive heart failure in 46-year-old-woman, (Diagnostic Problems) [Kushner & Szanto] *277
  dissolving corneal opacities in diabetic, 138; (reply) [Mann] 1838
  emphysema and lungs in, [Mayer] 1810—ab

OLD AGE—Continued
  fees, insurance, A. M. A. meeting report, 2148
  homes for aged, United Kingdom, 1395
  hyperthyroidism in, treatment, 1835
  Joint Council to Improve the Health Care of the Aged, A. M. A. resolution on voluntary health insurance, 65; 68; (report) 1102
  meprobamate addiction, [Boyd & others] *1839
  mortality among centenarians, Pa., 701
  National Committee on Aging of National Social Welfare Assembly, report on, 1103
  ocular senescence, Belgium, 2290
  operations for extreme mitral stenosis in, [Soullé] 1270—ab
  outlook of vascular surgery in, [Hitchcock] 1267—ab
  peptic ulcer after 60, clinical patterns, [Cutler] 449—ab
  positive health program for, proceedings available, (Council note) 1554
  problems related to public health, clinical practice and, [Underwood] *1000
  provide voluntary health insurance for retired persons, (Bureau article) [Polner] *194
  public aspects of aging population, WHO report, 928
  relation between condition of limbs and capacity for work, Denmark, 208
  Social Security Benefits: See Forand Bill
  subdural hematoma in, [Stuteville & Welch] *1445
  Suggested Guides for Organization and Operation of Medical Society Committees on Aging approved, 59
  treatment of psychiatric patients with carbutamide, Sweden, 211
  tuberculous tracheobronchial lymph-node involvement in, [le Melletier] 110—ab
OLEANDOMYCIN
  phosphate, N. N. D., 1011
  Triacetyl—: See Triacetyloleandomycin
OLIGOHYPOMENORRHEA: See Menstruation
OLIGOPHRENIA, PHENYLPYRUVIC: See Phenylketonuria
OLIVE pollen sensitivity, Israel, 2044
OPERATING ROOM: See Surgery
OPERATION: See Surgery; under names of specific organ and disease
OPHTHALMOLOGY
  Association for Research in, annual report on, 1073
  fellowship winners, 298
OPTOMETRISTS
  commissioning by Armed Forces, annual report on, 1068
  want amendment to Social Security Act, 2 letters from Dr. Blasingame to Congress regarding, 291
ORABETIC; ORANIL (carbutamide): See Sulfonylureas
ORCHESTRA: See Physicians, avocations
ORCHITIS: See Testes inflammation
ORF
  4 cases in human beings, United Kingdom, 313
ORGAN, modern, playing, [Leisure Corner] 815; (reply) [Shull] 2297—C
ORIENT, degenerative cardiovascular disease in, [Schroeder] 1697—ab
ORINASE (tolbutamide): See Sulfonylureas
ORISUL: See p-Amino-benzolsulfonamido-phenyl-pyrazol
ORPHENADRINE HYDROCHLORIDE
  treatment of Parkinsonism, Denmark, 208
ORTHOPEDICS
  use of sympathetic blocks in, [Brennan] *504
OSTEOARTHROPATHY
  hypertrophic pulmonary, absence in tuberculosis of lung, [Skorneck] 108—ab
  in smallpox, India, 1255
OSTEOLYSIS
  massive, [Johnson] 971—ab
OSTEOMYELITIS
  chronic, spiramycin for, [Marchis] 126—ab
  hypovitaminosis C and, in children, [della Casa] 1819—ab
OSTEOMYELOSCLEROSIS
  [Levi] 110—ab
OSTEOPATHY
  A. M. A. disapproved resolution on sovereignty of relationships between medical societies and, 2150
OSTEOPOROSIS
  ulcerative colitis and, unusual features, 1426
OSTEOSARCOMA
  trauma related to cause or aggravation of, 135
OTALGIA
  with esophageal hiatus hernia, [Malherbe] 952—ab
OTITIS MEDIA
  in nurslings after BCG vaccination, [Soboleva] 464—ab
  treatment: antibiotics, United Kingdom, 2049
OUTPATIENT DEPARTMENT
  pastoral counseling in medical center, [Young & Patrick] *24
OVARY
  activity, vaginal cytology to study, India, 2041
  cancer, mesonephric carcinomas, [Kay] 458—ab
  cancer, radioactive gold for, WHO report, 1397
  cystadenocarcinoma, and uterine pregnancy, [Chávez] 2315—ab
  cysts, progesterone for, 1294
  excision in breast cancer, correlate results with estrogen production, [Bulbrook] 947—ab
  excision plus adrenalectomy in metastasizing mammary cancer, [Hellström] 829—ab; [Davis] 2306—ab
  function, preserved in treatment of early cancer of cervix uteri in young women, [Krebs] 1939—ab
OVIDUCTS
  acute salpingitis, views on prognosis and treatment, [Hedberg] 1162—ab
  surgical management of tubal factor in infertility, [Cauwet] *991
  tuberculous salpingitis, treatment, [Rydén] 1161—ab
OXAMYCIN: See Cycloserine
OXYGEN
  deficiency, anoxia and hypoxia, new facts about the heart, (reply) [Hyman] 1151—C
  deficiency of abnormal physiologic origin as final common pathway in gastroduodenal ulcer genesis, [Palmer] 105—ab
  15, in study of pulmonary malfunction, WHO report, 1396
  hazards of therapy in respiratory disease, [Sherman] *1866
  manual and mechanical control of ventilation during cyclopropane anesthesia, [Wester & others] *2219
OXYGENATOR PUMP (mechanical heart)
  direct coronary artery perfusion for aortic valve surgery, [Kay & others] *1767
  extracorporeal circulation, 44 interventions with opened heart under, [Dubost] 1160—ab
  immediate postoperative period following total body perfusion, [Matthews] 1708—ab
OXYTETRACYCLINE
  treatment (intraperitoneal) in diffuse bacterial peritonitis in childhood, [Soave] 965—ab
  treatment (intraperitoneal) in peritonitis of appendical origin, [Adwan] 332—ab
  vs. silver nitrate in newborn eyes, incidence of conjunctivitis after, [Mathieu] 121—ab
OXYTOCIN
  hormone which inactivates, Austria, 2040

P

PAS: See Aminosalicylic Acid
PACEMAKER: See under Heart
PAIN
  abdominal, generalized, and acute renal failure, (Diagnostic Problems) [Kushner & Szanto] *1778
  abdominal, upper, esophagitis causes, [Bernstein & others] *27
  activation of patient with skeletal metastatic neoplasia, [Cummings & Rosenthal] *501
  alcohol-induced, in Hodgkin's disease, [Braun & Shnider] *1882
  chest, of colon origin, [Palmer] 1702—ab
  factor in syncope in healthy young adults, [Dermksian & Lamb] *1200
  generalized congenital analgesia, [Lamy] 464—ab
  in diagnosis of peripheral arterial emboli, [Phelan & Young] *1299
  in tongue in multiple sclerosis, treatment, 843
  neurophysiological basis for, in whiplash injuries, [Seletz] *1750
  problem back, [Kirkpatrick] *1864
  temporomandibular joint, unilateral, diagnosis and treatment, 472
  testicular, during coitus, 15 years after crushing injury, treatment, 1956
PALATE
  cleft, in second generation, prevent defect in third generation, 1957
PALFIUM: See 2, 2-Diphenyl-3-methyl-4-morpholino-butyryl-pyrrolidine
PAMISYL: See Aminosalicylic Acid
PAN washers, subungual hemorrhage in, [Long] *1226
PANCREAS
  abscess, gas as sign of, [Agnos] 944—ab
  cancer, clinical study, [Birnbaum] 324—ab
  cancer, diagnosis, (exfoliative cytology, rapid method of duodenal intubation) [Raskin] 440—ab; (secretin test) [Wenger] 441—ab
  cancer, radiation therapy in, [Billingsley] 1725—ab
  cystic fibrosis, Austria, 1797
PANCREAS—Continued
  cystic fibrosis, avitaminosis E in; morphology of gastrointestinal and striated muscle, [Blanc] 2071—ab
  cystic fibrosis, long-term study of 105 cases, [Shwachman] 832—ab
  cystic fibrosis, rectal prolapse in, [Kulczycki] 1699—ab
  disease, clinical evaluation of starch tolerance test, [Nugent & Millhon] *2260
  hypoglycemic sulfonamides show selective tropism for, France, 803
  infarcts, [McKay] 2179—ab
  insulin-producing capacity of diabetic children, [Klein] 1718—ab
  pseudocyst, clinical and surgical aspects, 58 cases, [Waugh] 451—ab
  [illegible] chronic re- [illegible] 217—ab
P[illegible]
  acute, and hyperdiastasuria after partial gastrectomy, [Wallensten] 1708—ab
  acute, atypical symptom-sign complex of, [Donhauser] 446—ab
  acute, Brazil, 2041
  acute, generalized abdominal pain and acute renal failure, (Diagnostic Problems) [Kushner & Szanto] *1778
  chronic relapsing, retrograde surgical drainage of pancreas for, [Puestow] 217—ab
PANCYTOPENIA: See under Anemia
PANEL
  advisory, and expert witness, [Sadusk] *2121
PANEMAX: See Papain
PANMYCIN: See Tetracycline
PAPAIN
  Panemax in treatment of strongyloidiasis, (Brazil) 802; [Asfora] 1703—ab
PAPILLOMA
  of large intestine, [Goldgraber] 967—ab
PARA-AMINOSALICYLIC ACID: See Aminosalicylic Acid
PARAGONIMIASIS
  of central nervous system, [Shih] 1713—ab
PARALYSIS
  agitans, chemopallidectomy for, 2 years' experience, [Paxton & Dow] *755
  agitans, excessive salivation in, treatment, 138
  agitans, globus pallidus and thalamic lesions in, basal ganglia surgery for, [Cooper] 2067—ab
  agitans, is it communicable? 1594
  agitans, orphenadrine for, Denmark, 208
  agitans, surgery for, symposium on, (reply) [Krusen & Ellwood] 319—C
  cerebral, extra-articular arthrodesis of subtalar joint in, [Baker & Dodelin] *1005
  cerebral, Little's disease, relation to premature birth, [Churchill] 831—ab
  electromyogram to evaluate neurological complications of spinal anesthesia, [Marinacci & Courville] *1337
  in Poliomyelitis: See Poliomyelitis
  infantile cerebrospastic, electrical activity of muscles in, India, 92
  peroneal, hazard of weight reduction, [Sprofkin] 826—ab
  respiratory, acute intermittent porphyria with, [Doll & others] *1973
  respiratory, long-term, rehabilitation in, [Neu] *1610
PARAMYOTONIA CONGENITA
  [Drager] 828—ab
PARANOIA: See Psychosis, paranoia
PARA-PAS; PARASAL: See Aminosalicylic Acid
PARAPLEGIA
  after spinal anesthesia, [Joseph & Denson] *1330
PARATHYROID
  crisis, cause of sudden death, [Hewson] 1157—ab
  idiopathic hypoparathyroidism, [Halvorsen] 1157—ab
  primary chief-cell hyperplasia of, new entity surgery of hyperparathyroidism, [Cope] 2186—ab
PARENTS: See Families
PARENZYME: See Trypsin
PARESTHESIA
  diagnosis of peripheral arterial emboli, [Phelan & Young] *1299
PARKINSONISM: See Paralysis agitans
PAROTID GLAND
  swelling, intermittent, due to ill-fitting dentures, [Furstenberg] 1579—ab
PAROTITIS, EPIDEMIC: See Mumps
PASTORS: See Religion
PATHOGENS in tobacco, 363
PATHOLOGY
  handling tuberculous specimens, 134
  pathologist's death certificate, "what is cause of death?" [Erhardt] *161; (reply) [Ziegler] 1260—C
PATIENTS
  care, 5 health groups aim: improve, [Medicine at Work] 1894
  Chronically Ill: See Disease, chronic
  ethical to disclose case history to insurance company? (Judicial Council opinion on) 1556

PATIENTS—Continued
  ethical to have another doctor perform surgery without knowledge and consent of? (Judicial Council opinion on) 1556
  in cardiac symptom formation, [Chambers & others] *1617
  National Joint Commission recommends formation in individual hospitals of committees on care of, 52
  parking and, Canada, 1679
  tort liability of charitable hospitals to, [Medicine and the Law] 788
PEDIATRICS
  fellowships in, 911; 912; 1244
  in transition, training, [Wheatley] *856; (reply) [DeBacker] 1929—C
PELIZAEUS-MERZBACHER DISEASE: See under Brain
PELVIS
  cancer, metastatic, from rectum, treatment, 472
PEMPHIGUS
  seborrheicus. Senear-Usher syndrome, [Chargin] 1163—ab
PEMPIDINE
  new hypotensive agent, United Kingdom, 318
  pharmacology and clinical use in hypertension, [Harington] 1416—ab
PENICILLIN
  Benzathine G: See Benzathine Penicillin G
  oral, United Kingdom, 2171
  Phenoxymethyl: See Phenoxymethyl Penicillin
  procaine G parenterally, and oral phenoxymethyl penicillin compared, [Mintz] 1277—ab
  prophylaxis in tetanus? 1169
  resistant staphylococci, Denmark, 919
  toxicity fatal, follow-up study, (reply) [Cooper] 319—C
  toxicity, hazards, [Herrell] *1875
  toxicity, penicillinase for reactions, [Becker] 346—ab
  toxicity: sensitivity in poliomyelitis vaccine, United Kingdom, 2046
  toxicity: sensitivity to penicillin cream, United Kingdom, 811
  treatment, aerosol, in chronic lung infection? 2083
  treatment of streptococcal infections. 3 oral and one parenteral form compared, [Breese] 1283—ab
  treatment plus dihydrostreptomycin, Sweden, 807
  V: See Phenoxymethyl Penicillin
PENICILLINASE
  toxicity, allergy, 2207
  treatment of penicillin reactions, [Becker] 346—ab
PENIS
  cancer, (Sweden) 211; [Ekström] 343—ab
  induration of corpora cavernosa, Peyronie's disease, treatment 1955
  possible role of smegma in carcinoma of cervix, [Heins] 2312—ab
PENSIONS or missiles, (Miscellany) [Orr] *1686
1:2:2:6:6-PENTAMETHYLPIPERIDINE: See Pempidine
PENTOLINIUM TARTRATE
  toxicity; death from, United Kingdom, 926
PENTOTHAL: See Thiopental
PEN-VEE: See Phenoxymethyl Penicillin
PEPTIC ULCER
  after 60, clinical patterns, [Cutler] 449—ab
  bleeding duodenal, bio-flavonoids and diet for, [Weiss] 216—ab
  bleeding duodenal, emergency surgical treatment, [Westland] 334—ab
  bleeding, 5-year follow-up, with and without surgery, [Donaldson] 1266—ab
  cause of, United Kingdom, 312
  etiology: biliary tract disease? 2080
  etiology; triamcinolone, [Brown] 2072—ab
  higher than average, significant occurrence of tuberculosis in, United Kingdom, 313
  hypoxia of abnormal physiologic origin as final common pathway in, [Palmer] 105—ab
  in children, [Hatfield] 2192—ab
  of esophagus, and peptic esophagitis, [Wolf] 128—ab
  perforating, in infants, [Grasveld] 218—ab
  protein therapy effects on serum proteins in, [Dupuy] 1406—ab
  pulmonary tuberculosis and, [Waingortin] 823—ab
  serum protein picture in gastroduodenal ulcer, [Dupuy] 1406—ab
  surgical treatment, cancer of stomach after resection for, [Cote] 1160—ab
  surgical treatment, exclusion gastrectomy removing mucous membrane of pylorus effective in preventing disease or recurrence? 227
  surgical treatment, long-term results in, [Pallette & Harrington] *20
  surgical treatment of duodenal ulcer, [Smithwick] 1159—ab
  surgical treatment, results of gastrectomy, [Bonniot] (resection according to Pólya) [Noring] 449—ab
PEPTIC ULCER—Continued
  surgical treatment, stump carcinoma after, [DeBray] 825—ab
PERICARDITIS
  benign acute, associated with Coxsackie viruses, [Movitt] 106—ab
  benign acute, in childhood, [Bono] 833—ab
PERICARDIUM: See Hemopericardium
PERINEUM
  urethral diverticulum, complication of ischium removal, [Comarr & Bors] *2000
PERIODICALS: See Journals
PERITONEUM
  cavity, soft drink bottle in, [Hoge & Thedieck] *40
  effusions, malignant, prednisone in, [Franco & others] *1645
  intraperitoneal adhesions, experimental study, [Jackson] 2065—ab
PERITONITIS
  appendical origin, treatment with and without intraperitoneal terramycin, [Adwan] 332—ab
  bacterial acute, intraperitoneal neomycin for, [Greene] 1288—ab
  bacterial diffuse, in childhood, intraperitoneal oxytetracycline and tetracycline for, [Soave] 965—ab
PERMAPEN: See Benzathine Penicillin G
PERPHENAZINE
  treatment in psychiatry, Norway, 922
PERSONALITY
  Minnesota Multiphasic Inventory, medical students and, New Zealand, 433
  speech relationship, U. of Cincinnati study, 1560
PERTUSSIS: See Whooping Cough
PESTICIDES
  A. M. A. Committee on, annual report, 1060
  health hazards to humans and wildlife from government sponsored mass control programs, 1061
PEYRONIE'S Disease: See Penis
PHARMACISTS
  case of druggist and disappearing rental, [Medicine at Work] 1896
  remuneration, United Kingdom, 927
PHARMACOLOGY
  new journals: *Biochemical Pharmacology, Toxicology and Applied Pharmacology,* and *Journal of Medicinal and Pharmaceutical Chemistry,* 1245
  new neuropharmacology research center, Washington, D. C., 2284
PHARYNX
  hypopharynx, cancer, Brazil, 802
PHENACETIN: See Acetophenetidin
PHENANTHROLINEQUINONE
  derivatives, treatment of amebiasis, India, 803
PHENERGAN: See Promethazine
N¹-β-PHENETHYL-FORMAMIDINYLIMINO-UREA HYDROCHLORIDE: See Phenylethyldiguanide
PHENOBARBITAL
  primidone biotransformation to, intoxication from, [Plaa & others] *1769
PHENOXYBENZAMINE HYDROCHLORIDE
  treatment (combined), antihypertensive agent, [Roberts] 1946—ab
PHENOXYMETHYL PENICILLIN
  in prophylaxis of recurrent rheumatic fever, [Kaplan] 1941—ab
  oral, vs. parenteral procaine penicillin G, [Mintz] 1277—ab
  potassium V and, antibacterial activity of serum after, [Kunin] 2071—ab
PHENPROCOUMON: See 3-(1-Phenylpropyl)-4-Hydroxycoumarin
PHENYLALANINE
  diet low in, for phenylketonuria in children, [Berry] 462—ab
  diet low in, for psychometabolic changes in phenylketonuria, [Meyer] 219—ab
PHENYLETHYLDIGUANIDE
  nonsulfonylurea oral hypoglycemic agent, clinical trials, [Krall] 835—ab
  treatment of diabetes, (United Kingdom) 316; [Hall] 1286—ab
PHENYLKETONURIA
  chemical and clinical observations during treatment, [Berry] 462—ab
  psychometabolic changes in, low-phenylalanine diet for, [Meyer] 219—ab
3-(1-PHENYLPROPYL)-4-HYDROXYCOUMARIN
  agent for short-term anticoagulant therapy, [Priest] 821—ab
PHENYLPYRUVIC OLIGOPHRENIA: See Phenylketonuria
PHEOCHROMOCYTOMA
  diabetes and glycosuria, [Freedman] 1703—ab
  in etiology of recurrent night sweats, 2208
  recurrent, case in previously treated child, [Cane] 464—ab
  treatment, current status, (Council report) [Thorn & others] *2130
PHLEBITIS
  peripheral, spontaneous acute, acenocoumarol for, [Rullo & others] *743
PHONOCARDIOGRAM: See Heart
PHOSPHATASE
  hypophosphatasia, 415—E
PHOSPHORUS
  dietary, and aluminum hydroxide, (reply) [Farrar] 1838
  inorganic phosphate, urinary excretion in patients with renal calcium stone, [Hodgkinson] 1820—ab
  organic phosphate poisoning, histochemical proof of, [Petty] 2199—ab
  radioactive colloidal chromic, destruction of hypophysis in prostate cancer, [Johnson] 1814—ab
  radioactive, for hemorrhagic thrombocythemia, [Fountain] 1582—ab
  radioactive, intravenously, intra-arterially and intracardially, for lung cancer, [Ariel] 350—ab
PHOTOGRAPHY
  medical, exhibit wins award, 903
  old photographs of autos wanted, Ill., 1909
PHYSICAL EXAMINATION
  for muscle weakness in infants and small children, [Johnson] *1306
  for physicians for Armed Forces, 1249
  for school children, tuberculin test in, (replies) [Faber; and original consultant] 984
  importance of routine cancer checks in cancer survival, [Archibald] 1930—C
  periodic, for physician himself, [McArthur] *1740
  premarital, [Scholten] *1171
  20-year study of physiological measurements in senior airline pilots, [Kidera] *1188
PHYSICAL FITNESS
  annual report of Bureau of Health Education, 1078
  of American youth, annual report, 1076
  programs, longitudinal research in, [McCammon & Sexton] *1440
PHYSICAL IMPAIRMENT: See Abnormalities; Disability; Handicapped
PHYSICAL MEDICINE
  therapeutic contributions of doctor of, [Blau] *1217
PHYSICAL THERAPY
  mobile unit, United Kingdom, 807
  schools of, 1546
  sympathetic blocks with, in orthopedic surgery, [Brennan] *504
PHYSICIANS: See also General Practitioners; Specialties; under name of specific specialists, as Surgeons
  advisor to industrial management, [Keene] *1851
  aid for, in South Carolina, [Smith] 1684—C
  are we making same mistakes British doctors made? (Miscellany) 931
  avocations, gems and precious stones, [Leisure Corner] 1261
  avocations, motoring, [Leisure Corner] 103
  avocations, orchestras for, N. Y., 2158
  avocations, painting depicting Health Service, United Kingdom, 435
  avocations, playing the modern organ, [Leisure Corner] 815; (reply) [Shull] 2297—C
  avocations, subpostmaster, United Kingdom, 2049
  avocations, wood carving, [Leisure Corner] 1930
  biographical records, annual report, 1082
  central repository of medical credentials, annual report on, 1070
  certification of absence from work by, 1019—E
  compensations in occupational medicine, [Belknap] *1847
  damages for widow of doctor who died in line of duty, United Kingdom, 315
  Deaths: See also list of Deaths at end of letter D
  death of Warren W. Furey, 1793
  direct or VENDOR system of payments to, from public funds, Council reports on, 58; 1106
  discharged from Armed Forces, annual report on, 1069
  doctor fined for giving prescriptions for meperidine for own use, United Kingdom, 1153
  ethical to discuss case with patient's lawyer? (Judicial Council opinion on) 1555
  foreign, American urology's obligation to, [Barnes] *750
  foreign, Educational Council for, annual report on, 1089; 1090
  foreign, in V. A., 1532
  foreign, licensed by State Boards. 167:622, May 31, 1958; (correction) 168:2161, Dec. 20, 1958
  foreign, "Present and Future Status of Foreign Medical School Credentials in U. S.," annual report on, 1089
  foreign, training in U. S. hospitals, 1523

PHYSICIANS—Continued
  foreign, 12 nations attend Navy training program, 911
  "free choice" and other limitations under Medicare, 111—E; (Council article) *696
  free choice of in medical service plans, (A. M. A. resolutions on) 64; 70; (President's page) 416
  hospital, and general practitioner change places, Denmark, 706
  iatrogenic adrenal insufficiency, treatment, (Council report) [Thorn & others] *2130
  iatrogenic disease and anesthesia, [Dundee] 974—ab
  iatrogenic diseases in children, 895—E
  in cardiac symptom formation, [Chambers & *others*] *1617
  in federal service, participation in local medical society affairs by, reports on, 58; 1069
  military, A. M. A. liaison with, annual report on, 1069
  military, compensation for, annual report on, 1068
  National Interprofessional Code for Attorneys and, 1661—E; [Medicine and the Law] 1663
  Nazi camp doctor, action on, United Kingdom, 97
  need not give death certificates, United Kingdom, 2045
  nominated for football honor, 2281
  obligations in medicine as a profession, (President's page) 1020
  office, case of druggist and disappearing rental, [Medicine at Work] 1896
  office, excerpts from brochure on Business Side of Medical Practice, [Buiness Practice] 818; 935; 1155; 1262; 1401; 1691; 1806; 1932; 2050; 2176
  office, permissible to hold open house? (Judicial Council opinion on) 1555
  on school boards, W. Va., 911
  pay increase refused, United Kingdom, 98
  pay, Japan, 806
  physical medicine, therapeutic contributions of, [Blau] *1217
  physician himself, [McArthur] *1740
  place in public affairs, (Miscellany) [Judd] *99
  placement, annual reports on, 1069; 1112
  placement, profession as "matchmaker," [Medicine at Work] 777
  placement, survey, Alabama, [Medicine at Work] 777
  practicing, as your practice grows, [Business Practice] 2176
  practicing, experience with Community Health Council questionnaire, [Babow & others] *268
  practicing, private, relation to those not in private practice, 1112
  relation to administrators of medical care plan of UMWA, A. M. A. resolutions on, 66
  relation to hospitals, A. M. A. resolution on, 68
  relation to patient, assay of antianginal agents; "rapport period," [Cole & others] *275
  relationships: problems related to public health, clinical practice, aging, and long-term illness, [Underwood] *1000
  schools and, national conference on, annual report on, 1079
  separated from active military service, (Council survey) 1904
  share of public costs for indigent care, [Medicine at Work] 770
  Social Security for: See Social Security
  Southeast, information service for, 79
  subject to draft call in 1959, (Council report) 906
  supply and placement, Alabama Community Medical Rating survey, (Council survey) 1378
  supply, distribution, United Kingdom, 2047
  supply, import, Sweden, 807
  supply, shortage of radiologists, Norway, 1572
  supply, shortage, Sweden, 1801
  V. A., A. M. A. membership for, annual report, 1117
  what insurance should a doctor carry? [Business Practice] 1691
  women, Dr. Sabin honored in National Statuary Hall, Colo., 1787
  women, Dr. Snow, state "General Practitioner of Year," Mass., 1910
PHYSICS, MEDICAL
  A. M. A. Council on, annual report, 1059
  of atmosphere and space, international symposium on, 797; [Medicine at Work] 1369
PHYSIOLOGY
  measurements in 100 senior airline pilots, 20-year study, [Kidera] *1188
PICK'S DISEASE: See Polyserositis
PIGMENTATION: See also Melanin pigmentation
  hypopigmentation following planing, how can one get an even suntan? 361
  incontinentia pigmenti, [Lamy] 1278—ab
  multiple pigmented nevi in 12-year-old, treatment, 473
PIGMENTATION—Continued
  of gums, diagnosis, 1296
  progressive pigmentary dermatosis, treatment, (replies) [Benedek; and original consultant] 1594
PIGS
  Coxsackie virus pneumonia possibly transmitted to human subjects by, [Verlinde] 1825—ab
PILONIDAL SINUS
  cysts, carcinomatous degeneration, [Matt] 2311—ab
PIPEROCAINE HYDROCHLORIDE
  as spinal anesthetic, pharmacology, [Featherstone] *1327
PITOCIN: See Oxytocin
PITUITARY
  anterior, primary failure, cobalt radiation of value? 1732
  destruction by radioactive colloidal chromic phosphate in prostate cancer, [Johnson] 1814—ab
  destruction by radioactive seeds, WHO report, 1397
  destruction, hypophysectomy with yttrium^{90} implant, [Gleadhill] 2307—ab
  destruction, implant yttrium-90 for metastatic mammary cancer, United Kingdom, 315
  dwarfism, diagnosis and treatment, [Martin] 957—ab
  excision, effects on intelligence, [Schon] 2310—ab
  excision for breast cancer, (United Kingdom) 316; [Baron] 949—ab
  excision in breast cancer, correlate clinical results with estrogen production, [Bulbrook] 948—ab
  excision, in severe diabetes, neurosurgical aspects, [Javid] 1814—ab
  extract to increase growth in boy with von Gierke's disease? 1594
  Hormones: [illegible]pin
  interstitial [illegible] indications, tec[illegible] 1289 —ab
  transection of stalk for metastatic mammary *carcinoma*, [Dugger] 2181—ab
  tumors, ACTH-producing, [Nelson] 1158—ab
  tumors, adenomas and craniopharyngiomas, surgical treatment with adrenocortical hormone therapy, [Decourt] 451—ab
PITYRIASIS
  rosea, etiology, 1958
  versicolor, treatment, 1956
PLACEBO
  in evaluating meprobamate addiction, [Boyd & others] *1839
PLACEMENT: See Physicians
PLACENTA
  passage of L. E. factor, [Mijer] 221—ab
  previa, fetal blood loss with, 1168
PLANING
  [illegible], how can one get an [illegible]
P[illegible]: See Blood Transfusion
PLASMIN: See Fibrinolysin
PLASMOCYTOMA
  unusual types, Austria, 2040
PLASTIC
  needle for spontaneous pneumothorax, [Knuth & others] *177
PLATELETS: See Blood platelets
PLEURA
  biopsy in diagnosis of effusions, [Hill] 946—ab
  effusion, solitary, due to myxedema, [Schneierson & Katz] *1003
  effusions, malignant, prednisone for, [Franco & others] *1645
  manifestations in cirrhosis, France, 92
  pleuritis in systemic lupus erythematosus, importance in early diagnosis, [Winslow] 946—ab
PLEURISY
  purulent, pulmonary decortication in, France, 91
  serofibrinous, in pulmonary tuberculosis in children, incidence of morbidity and disorders secondary to, before and after antibiotic era, [Batini] 2317—ab
  with effusion, India, 1393
PNEUMOCHOLECYSTITIS: See Gallbladder, *Inflammation*
PNEUMONIA
  complications: lung abscess in infancy and childhood, lobectomy for, [Moore] 2308—ab
  complications: pseudo air cysts in children, [Schlager] 1817—ab
  Coxsackie, possibility of infection by pigs, [Verlinde] 1825—ab
  plasma-cell, in infants, etiology, [Moser] 1413—ab
  plasma-cell, interstitial, adenoviruses cause? [Vivell] 1412—ab
  post-influenzal, fulminating, [Buechner] 105—ab
PNEUMONIA—Continued
  staphylococcic, in infancy and childhood, [Hendren & Haggerty] *6; (cortisone for) [Bühler] 222—ab
  Staphylococcus aureus importance in 1957 influenza epidemic, [Robertson] 1585—ab
  with abscess formation in infants, therapy, [Bucha] 222—ab
PNEUMONOCONIOSIS
  diagnosis of silicosis, Sweden, 1394
  from bagasse, cement and agave, [Baader] 1721—ab
  in iron miners, [Even] 1720—ab
  information on bagassosis due to sugar cane sensitivity, 134
  meeting, Geneva, Switzerland, 2282
PNEUMOPERITONEUM, *ARTIFICIAL*
  how frequent is spontaneous pneumothorax found in? 2083
  in tuberculosis of lung, India, 434
PNEUMOTHORAX, ARTIFICIAL
  for pulmonary tuberculosis, [Rogue] 2300—ab
PNEUMOTHORAX, SPONTANEOUS
  chronic recurring, due to endometriosis of diaphragm, [Maurer & others] *2013
  complications of routine laparotomies or therapeutic pneumoperitoneum, 2083
  in Asian influenza, [Welsh] 1698—ab
  surgical treatment using plastic needle, [Knuth & others] *177
POISON CONTROL CENTERS
  American Association of, formed, 2159
  in Denver, first in Colo., 1665
  plea for, Sweden, 2294
POISONING
  accidental, control: progress report, [Cann & others] *717
  acute, from inhaling mercury vapor, [Matthes] 2317—ab
  A. M. A. Committee on Toxicology, annual report, 1062
  barbituric acid, acute, treatment, 10 years' experience, [Louw] 457—ab
  carbon tetrachloride, in hairdressers, [Warshaw] 710—C
  cascara, United Kingdom, 316
  citrate, United Kingdom, 926
  economic, A. M. A. report discussing morbidity and mortality to be published, 1060
  emergencies, efficient handling of, [Bidder & Sunshine] *514
  Food: See Food poisoning
  in Children: See Children
  Industrial: See Industrial Dermatoses; Industrial Diseases
  phosphate, organic, histochemical proof of, [Petty] 2199—ab
  radium, where are cases of? [Clark] *761; 779—E; (reply: teeth changes as signs of) [Dalitsch; Clark] 1929—C
  "scrap iron" intoxication, [Gadsden & others] *1220
  suicidal, [Norbury] 1712—ab
POLIOMYELITIS
  acute and convalescent, abnormalities in central respiratory regulation, [Plum] 2067—ab
  antibodies before and after Salk vaccination in infants and children, [Buser] 220—ab
  antibodies, persistence of, Canada, 91; [Müller] 341—ab
  center, grant from National Foundation, Ga., 908
  encephalomyelitis myalgica epidemica resembles, [Gsell] 117—ab
  epidemiology, in Switzerland, [Schär] 219—ab; 220—ab
  foreign virologists visit U. S., 1562
  in etiology of muscular dystrophy in mental deficient boy of 8, 1422
  morbidity trends, 1913
  multiple cases in one family, [Scarabicchi] 827—ab
  National Foundation: See Foundations
  paralytic, increase in, plea *for continuing* vaccination program, 51—E
  paralytic, prevention of urinary calculi after, [Plum] *1302
  paralytic, respiratory, rehabilitation in, [Neu] *1610
  Portugal, 310
  prevalence, new cases, N. Y., 910
  prevalence, U. S., 80; 199; 297; 423; 702; 1385; 1564; 1669; 1790; 1913; 2032
  statistics on, 1143
  vaccination, A. M. A. action, (annual report) 1051; 2150
  vaccination, death after, United Kingdom, 709
  vaccination, first results, [Berger] 220—ab
  vaccination *(mass) with live attenuated virus*, in Belgian Congo and Ruanda-Urundi, [Courtois] 1589—ab
  vaccination, nephritis related to? 360
  vaccination, (Norway) 96; (United Kingdom) 313; 925
  vaccination, reminding patients to obtain, 1958
  vaccine attenuated virus, theoretic foundation and selection of strains; use of Sabin vac- [illegible]

POLIOMYELITIS—Continued
vaccine, British, antigenic activity, [Perkins] 118—ab
vaccine, intradermal and oral administration, United Kingdom, 709
vaccine, response of pregnant women and their infants to, [Martins da Silva & others] *1
vaccine (Salk type), potency and safety, [Sunada] 1291—ab
vaccine, sensitivity to penicillin in, United Kingdom, 2046
vaccine, serological response of infants to, [Perkins] 1164—ab
vaccine, 3 years' experience in Ontario, [Brown] 1825—ab
virus in children under five, United Kingdom, 2296
virus isolations in Hawaii, first, [Yuen] 1411—ab
POLIOMYELITIS IMMUNE GLOBULIN (Human)
for oral herpetiform lesions, N. N. D., 183
POLITICS
in National Health Service, United Kingdom, 2047
younging of electorates, annual report on, 1081
POLLENS
factors in drug evaluation in hay fever, (reply) [Engelsher] 1685—C
filters, most effective type, 1593
olive, sensitivity to, Israel, 2044
sampling stations established, N. Y., 910
POLYCYCLINE: See Tetracycline
POLYCYTHEMIA
erythremic myelosis and familial thalassemia, [Olshin] 1281—ab
nephrogenous, [Forssell] 1821—ab
vera, busulfan for, [Louis] *1880
vera, host factors in, [Damon] 438—ab
vera, pyrimethamine for, [Frost] 2323—ab
POLYHYDRAMNIOS
aid to early diagnosis of congenital obstruction of alimentary tract, [Lloyd] 462—ab
POLYNEURITIS: See Neuritis
POLYPS
colon, and malignancy, Brazil, 430
lymphoid, of rectum and anus, [Holtz] 115—ab
polyposis of colon, Brazil, 2168
POLYSACCHARIDES
lipo-, highly purified bacterial, for inflammation of adnexa, [Fricke] 1273—ab
POLYSEROSITIS
edema, anasarca and, anomalous case of, [Rowntree & others] *411
PONTOCAINE: See Tetracaine
POPULATION
state, ratio of first-year students to, 1510
PORPHOBILINOGEN in Urine: See Urine
PORPHYRIA
acute intermittent, with respiratory paralysis, [Doll & others] *1973
cutanea tarda, vesicular and bullous disease, 982
urinary delta-aminolevulic acid and porphobilinogen in different types of, [Haeger] 2181—ab
PORTACAVAL SHUNT
emergency, [Mikkelsen] 949—ab
esophageal varices before and after, [Evans] 129—ab
PORTAL VEIN
cirrhosis, heart disease in patients dying with, [Lunseth] 2180—ab
hypertension, shunting procedures, [Partington] 432—ab
pressure, determine by catheterization of hepatic vein and by direct puncture during operation, [Bücherl] 432—ab
splenoportography, advantages and disadvantages, [Figley] 973—ab
venography in children, India, 921
POST OFFICE, doctor as subpostmaster, United Kingdom, 2049
POSTAGE STAMPS
Noah Webster 4-cent bicentennial stamp, (Miscellany) [Thoms] 1804
POSTOPERATIVE: See Surgery
POSTURE
change, factor in syncope in healthy young adults, [Dermksian & Lamb] *1200
exercises for asthmatic children, [Scherr & Frankel] *1996
sleeping position of children, 1592
POTASSIUM
citrate, open heart surgery with elective cardiac arrest by, [Sones] 2063—ab
in Blood: See Blood
intoxication, fulminating, in atypical heat stroke, [Baxter] 109—ab
POUDRAGE
in surgery for endocardial fibroelastosis or anomalous left coronary artery, [Paul] 112—ab
PRECEPTORSHIPS
at U. of Wisconsin, 30-year experiment, 1466
PREDNISOLONE
acetate, N. N. D., 183
Methyl—: See Methylprednisolone
treatment, massive doses in acute leukemia in adults, [Granville] 1286—ab
PREDNISONE
amidopyrine and: Pyracortine, India, 2043
treatment in tuberculosis, (India) 1681; (Portugal) 2170
treatment (long-term) in lupus erythematosus, scleroderma and neurodermatitis disseminata, [Kanee] 1812—ab
treatment of acute leukemia, (France) 209; [Picard] 1264—ab; (massive doses in adults) [Granville] 1286—ab
treatment of diphtheritic laryngeal obstruction, India, 707
treatment of malignant effusions, [Franco & others] *1645
treatment of rheumatoid arthritis, metabolic and clinical effects, [Ward] 836—ab
treatment plus diamthazol for non-inflammatory scalp ringworm, [Kanof] 2318—ab
PREECLAMPSIA: See *Eclampsia*
PREGNANCY
after mastectomy, 1955
after pneumonectomy for tuberculosis, 74 pregnancies, [Laros] 2312—ab
age of, probabilities at 38, 362
anemia in, United Kingdom, 923; (iron-deficiency, prophylaxis) [Kerr] 1939—ab
at high altitudes, study, 299
blood cholesterol during, (reply) [Wetstone] 844
complications: ear eczema, hormones influence? 227
complications: edema, acetazolamide for, [Morra] 2070—ab
complications: edema, chlorothiazide for, [Chesley] 2071—ab
complications: heart disease, current status, [Kaufman] 338—ab
complications: kyphoscoliosis, [Marchand] 2314—ab
complications: narcotic addiction, withdrawal symptoms in newborn infants, [Kunstadter & others] *1008
complications: precordial murmurs during, [Hurst] 1939—ab
complications: regional ileitis, 2332
contraindicated after surgery for breast carcinoma? 2334
[illegible] tions of ecto- [illegible] mother with a haptene? 2207
diabetes i [illegible] in babie [illegible]
diagnosis, [illegible] bleeding [illegible]
duration, [illegible]
ectopic, a [illegible] others] *985
ectopic, cervical, [Mayberger] 120—ab
hormone which inactivates oxytocin, Austria, 2040
hydramnios in diagnosis of congenital obstruction of alimentary tract, maternal and fetal factors, [Lloyd] 462—ab
"Multiple Birth Roster" established in New York City, 1666
normal, metabolic and biochemical changes in, (Council article) [Macy] *2265
nutrition in, and fetus, (Council article) [Hepner] *1774
nutrition in, Vanderbilt study of maternal and infant nutrition, (Council article) [McGanity & others] *2138
nutritional state prior to conception, (Council article) [Stearns] *1655
ophthalmoscopic examination during, Brazil, 706
previous, can Rh factor change without? 1833
produce experimental congenital malformations by dietary measures, (Council article) [Warkany] *2020
prognosis after hypofibrinogenemia, 2085
radiation during, leukemia in infant due to, United Kingdom, 314
response of women and their infants to poliomyelitis vaccine, [Martins da Silva & others] *1
Toxemia: See also *Eclampsia*
toxemia, factors in decline of maternal mortality, [Klein & Clahr] *237
toxemia, influence of chlorothiazide on water and electrolyte excretion in, [de Alvarez & O'Lane] *2226
toxemia, late, intravenous Apresoline in, *[Johnson] 459—ab*
toxemia, low-sodium diets in, (Council report [Danowski] *1886
toxemia, myocardial failure in, [Siliquini] 2191—ab; *(correction)* 2282
uterine, cystadenocarcinoma of ovary and, [Chávez] 2315—ab
vibration effects on, 474
wastage, and diabetes, A. M. A. Subcommittee on, annual report, 1060
PREOPERATIVE: See Surgery
PREPUCE
herpes progenitalis, treatment, 473
PRESCRIPTIONS
doctor fined for prescribing meperidine for his own use, United Kingdom, 1153
prescribing and dispensing drugs by physicians, (Judicial Council opinion on) 1556
proposed restriction on, United Kingdom, 709
PRESS
A. M. A. News, bi-weekly, 58; (report on) 1042
Chronic Illness Newsletter, annual report, 1103
Los Angeles Times, article reprinted from, (Miscellany) [Hotchkiss] 933
relations of A. M. A., annual report, 1050
sensationalism in medicine, United Kingdom, 809
PREVENTIVE MEDICINE
2146—E
in private practice, [Vastine] *1185
PRIMIDONE
toxicity, due to biotransformation to phenobarbital, [Plaa & others] *1769
PRISCOLINE: See *Tolazoline*
PRIVILEGED COMMUNICATIONS
annual report of Law Department, 1045
PRIZE FIGHTING: See Boxing
PRIZES AND HONORS
Academy of Psychosomatic Medicine, award of merit, 299
Air Force Commendation Medal, (N. C.) 1560; 2284
Albany Medical College annual lectureship award, 1241
Allstate Safety Crusade Certificate of Commendation in traffic safety, Va., 76
Alvarenga Prize, Texas, 421
American Cancer Society's "Medallion and Citation," S. C., 1243
American College of Chest Physicians essay contest, 298
American College of Surgeons, Distinguished Service Award, W. Va., 2031
American Heart Association, cardiovascular research award, Ohio, 1242
A. M. A. award to CBS for broadcasts of San Francisco meeting, (photo) 193
A. M. A. awards, annual reports, 1051; 1054; 1073
A. M. A. awards at San Francisco, 53; (for Scientific Exhibits) 900; (Section Awards) 901
A. [illegible] Award, submit [illegible]
A. [illegible] award, (nomi- [illegible] d to Dr. L. A. [illegible] 74
American Medical Writers' Association, distinguished service awards, 1140; 1562
American Society of Maxillofacial Surgeons, essay contest, 1245
American Writers' Association honor award, Minn., 1141
"Annual Prize for Medico-Surgical Cinema," 2280
Arkansas Conference of Tuberculosis Workers, first annual award, 2155
Billings medals, 901
Blackwell (Elizabeth) award of Hobart and William Smith Colleges, 2160
Borden award, 423; 1559
Bronze Medal of Canadian and American Medical Association, and first prize of New York State Medical Association, N. H., 909
Burdick (Ward) award of American Society of Clinical Pathologists, Minn., 2157
Caldwell medal, Calif., 1239
Ciba Foundation awards for aging research, 77
Commander of the Order of Merit *of the* Republic of Italy, Chicago, 418
Dearborn Chamber of Commerce "Distinguished Citizen's Award," Mich., 2278
Fiske (Caleb) Prize of Rhode Island Medical Society, essay *contest open*, 77
Fringer (Alma A.) *memorial award from* Illinois Tuberculosis Association, 293
Gairdner Foundation International awards in arthritis and heart disease, first, 2281
"General Practitioner of the Year," Mass., 1910
Gerontological Research Foundation award, 1145
Goldberger award, 53; 1058
Hektoen medals, 901
Howe (William A.) Honor Award of American School Health Association to, Dr. Bauer, 1663
Huddilston (Roselle W.) Medal, Maine, 1909
Illinois State Medical Society, "Outstanding General Practitioner for 1959," 2156
Institute of Medicine of Chicago offers annual prize in medicine, 198; (George H. Coleman medal) 908
International Award ACQUI *TERME of Rheumatology*, 1246
International Memorial Award for Psoriasis Research announced by Baylor University, 421

PRIZES AND HONORS—Continued
  Jones (T. Duckett) Memorial Award, 1669
  Kimble Methodology Research Award, Mass., 1788
  Knudsen (W. S.) award for "most outstanding" contributions to industrial medicine, Calif., 197
  Langer (Ann) Cancer Research Foundation, 2280
  Lasker (Albert) award, annual, 794
  Lederle Laboratories faculty awards, 79
  Lovelace Foundation award, first annual, Pa., 2031
  Mental Hospitals Achievement Award of American Psychiatric Association, Neb., 2278
  Michigan Society of Neurology and Psychiatry research award, 1910
  Mississippi Valley Medical Society's Honor Award, La., 1787
  National Medical Association, distinguished service award gold medal, Chicago, 418
  Neuberg Medal award in Biochemistry, N. Y. 1560
  New York U. Medal, 910
  Nobel Prize winners, 1915; 2159; (United Kingdom) 2296
  Northwestern U. Medical School, Founders Day Awards, 2029
  offered by doctors to foster scholarship among teenagers, [Medicine at Work] 1891
  Officer in National Order of Merit and Honor of the Republic of Haiti, N. Y., 1789
  "Oregon Doctor of the Year," 1141
  Osborne and Mendel award of American Institute of Nutrition, 1059
  Osler (William) Medal of American Association for History of Medicine open, 200
  "outstanding protector of public health," U. of Buffalo, 1559
  Peruvian Cross of Merit to Surgeon General Hogan, 1915
  Phi Lambda Kappa Medical Fraternity award for nonphysicians' contribution to medicine, Md., 1140
  President's Committee on Employment of Physically Handicapped, special citation, N. Y., 1667
  Radiological Society of North America Gold Medal, Calif., 2028
  Reed (Walter) Medal, 1241; 1915
  Sedgwick Memorial Medal, 794; 1239
  Sheard-Sanford prize for meritorious research by medical students, 1143
  Sheridan Rotary Club, "Outstanding Citizen" award, Ind., 1558
  Societé Internationale de chirurgie, President's Prize of, N. Y., 2158
  Society of Biological Psychiatry award, 200
  Speidel (Edwin and Hanna) Award of International College of Surgeons, N. Y., 700
  Sunderman award for "Clinical Scientist of Year," Puerto Rico, 295
  U. of Minnesota's outstanding achievement award, N. Y., 2030
  U. of North Dakota Alumni Association Distinguished Service Citation and Modern Medicine Distinguished Achievement award, 75
  U. of Rochester Medical Alumni Association, Gold Medal, 1666
  Van Meter Award, 1562; (New Zealand) 1570
  Wellcome Prize, Hawaii, 2277
  Wisconsin Anti-Tuberculosis Association, "award for distinguished service," 791
PROCAINE
  absorption of local anesthetic, [Campbell & Adriani] *873
  as spinal anesthetic, pharmacology, [Featherstone] *1327
PROCHLORPERAZINE
  toxicity: severe neurological manifestations in children, [Jabbour] 1581—ab
PROCTOCAINE
  treatment with surgery in hemorrhoids, India, 433
PRODOX: See Hydroxyprogesterone Acetate
PROFESSIONAL SECRECY: See Privileged Communications
PROFESSIONS
  medicine as, obligations of physicians, (President's page) 1020
PROGESTERONE
  induced withdrawal bleeding as test for pregnancy, [Hayden] 1272—ab
  treatment of ovarian cysts, 1294
PROMAZINE HYDROCHLORIDE
  toxicity: arterial thrombosis with gangrene, [Opinsky & others] *1224
PROMETHAZINE HYDROCHLORIDE, N. F.
  treatment in obstetrics, 2½ year survey, [Carroll & Moir] *2218
  treatment of tetanus, [Miller & Stoelting] *393
PROPASA: See Aminosalicylic Acid
PROPRIETARIES
  advertising of, (A. M. A. resolution on) 68; (report) 1052
PROPTOSIS: See Eyes, proptosis
2,5 di-PROPYLOXY-3,6-DIETHYLENIMINOBENZOQUINONE
  treatment of advanced malignant neoplasms, [Brunschwig] 961—ab
PROSTATE
  cancer, cytodiagnosis, [Frank] 466—ab
  cancer, "depot" estrogens for, [Salsano] 1287—ab
  cancer, destroy hypophysis with radioactive colloidal chromic phosphate in, [Johnson] 1814—ab
  cancer, diagnostic meaning of calcium metabolism changes after sex steroids in, [Molinatti] 1947—ab
  cancer, diethylstilbestrol treatment cause night sweats and dizziness? 983
  cancer, serum mucoproteins in, [Arcadi] 1943—ab
  cancer, 200 cases treated conservatively, [Satter] 2321—ab
  vesiculoprostatitis, chronic; a reorientation, [Leader] *995
PROTEIN
  absorption and regional enteritis, 2205
  changes in multiple myeloma, [Prato] 215—ab; 216—ab
  dietary, effects on cholesterolemia and atherogenesis in cockerels on high-fat, high-cholesterol mash, [Stamler] 976—ab
  dietary, effects on plasma lipids and atherogenesis in cholesterol-fed cockerels, [Stamler] 976—ab
  in *Blood*: See *Blood proteins*
  in Lymph: See Lymph
  moieties, characterization of lipoproteins, grant to U. of Florida for study of, 790
  therapy, influence on serum proteins in ulcer, [Dupuy] 1406—ab
PROTHROMADIN: See Warfarin Sodium
PROTHROMBIN: See Blood prothrombin
PROTOVERATRINE
  treatment (combined), antihypertensive agent, [Roberts] 1916—ab
PROTOZOA
  intestinal, acquisition by children in Egypt, [Kuntz] 1282—ab
  uveitis caused by, [Kessel] 345—ab
PRURITUS
  complicating cirrhosis treatment, 1297
  trimeprazine orally for, [Williams] 2318—ab
PSEUDOHERMAPHRODITISM: See Hermaphroditism
PSEUDOMONAS
  aeruginosa, endocarditis due to, prognosis, (reply) [Gottsegen] 1929—C
PSEUDOMYOTONIA: See Myotonia
PSORIASIS
  fat and calcium metabolism relationship, 716
  Kaposi's sarcoma superimposed on erythroderma psoriaticum, [Segal] 465—ab
  research, International Memorial Award in, Baylor University announces, 421
PSYCHIATRY
  child, traineeships in, Mass., 1140
  grant support for training in, 1249
  meprobamate in, Finland, 308
  perphenazine in, Norway, 922
  problems and preferences for instruction, appraisal of reports by general practitioners, [Wittson & others] *1747
PSYCHOLOGY
  psychological medicine in general practice, United Kingdom, 1573
PSYCHOSIS
  advanced, reserpine for, [Norman] 955—ab
  after Asian influenza, Israel, 2044
  alcoholic, Sweden, 2294
  etiology: amphetamine, United Kingdom, 2046
  etiology: myxedema, [Rullo & Allan] *890
  paranoia, isolation stress in, [Ziskind] *1427
PSYCHOTHERAPY
  for emotional problems after organic brain disease, 136; (replies) [Paley; and original consultant] 2086
PTYALISM, treatment, 2204
PUBERTY: See also Adolescence
  precocious, and hormone excretion in girls, [Bulbrook] 1819—ab
PUBLIC
  affairs, doctor's place in, (Miscellany) [Judd] *99
  Health: See Health, public
  opinion on cancer, United Kingdom, 1573
  relations, A. M. A. annual report on, 1049
  relations and economics, Canada, 90
  relations, successful adventure using television: Rochester, N. Y. Health Forum, [Townsend & Steinhausen] *1983
PUERPERIUM
  intracranial venous thrombosis in, [dalle Ore] 956—ab
  postpuerperal cerebral thrombophlebitis, France, 803
PUERTO RICO
  proposed regionalization, A. M. A. resolution on, 69
PULMONARY VALVE
  stenosis, surgery for, [Pliego] 1710—ab
PULSE
  pulseless disease, [di Bello] 1698—ab
PUMP: See Oxygenator Pump
PUNCH in galvanized container poisonous, Calif., 790
PURINE
  antagonists for choriocarcinoma and related trophoblastic tumors, [Li] 1416—ab
6-PURINETHIOL; Purinethol: See Mercaptopurine
PURPURA
  etiology: chlorothiazide, [Jaffe & Kierland] *2264
  thrombocytopenic, idiopathic, treatment, [Watson-Williams] 1822—ab
  thrombocytopenic, neonatal, India, 1798
  thrombocytopenic, treatment, United Kingdom, 811
  thrombopenic, as complication of mumps, [Kolars & Spink] *2213
  thrombopenic, radioactive phosphorus for, [Fountain] 1582—ab
PYELONEPHRITIS
  ascending, role of ureter in pathogenesis, [Talbot] *1595
  chronic, hyperchloremic acidosis in, [Lathem] 215—ab
  clinical and histologic spectrum of, [Schreiner] 820—ab
  Norway, 310
PYODERMA
  in runners, Sweden, 211
PYRACORTINE
  for rheumatic diseases, India, 2043
PYRAMIDON: See *Aminopyrine*
PYRAZINAMIDE
  new antituberculosis drug, [Zorini] 834—ab
  treatment (topical) in tuberculous empyema, [Costa] 2324—ab
PYREXAL: See Lipopolysaccharides
PYRIDOXINE (vitamin B_6)
  to prevent isoniazid toxicity, [Ross] *273; (reply) [Middlebrook] 1685—C
  treatment plus hydrocortisone in multiple sclerosis, [Reyes Oliveros] 220—ab
PYRIMETHAMINE
  treatment of polycythemia vera, [Frost] 2323—ab
PYRIZIDIN: See *Isoniazid*

Q

Q FEVER
  United Kingdom, 2047
QUACKERY
  A. M. A. Bureau of Investigation annual report, 1063
  case of convicted psychiatrist, Dr. Reddick, who issued licenses to naturopaths, etc., 1064
QUINACRINE
  antimalarial drug for arthritis, Denmark, 208; [Erlendsson] 964—ab
QUININE
  resin, tubeless gastric analysis using, India, 210
QUINOLINE: See Chloroquine
QUINONES
  2,5 di-propyloxy-3,6-diethyleniminobenzoquinone for advanced malignant neoplasms, [Brunschwig] 964—ab
  tetrahydroxyquinone, oral treatment of keloids, [Kelly] 2073—ab

R

RI VIRUSES: See *Adenovirus*
RABIES
  in *coyote*, Mich., 909
  in Latin America, Dr. Habel consults on, D. C., 2028
  in Oswego County, N. Y., 294
  vaccine (duck embryo), N. N. D., 1771
RACES: See also Negroes
  colored immigrants, United Kingdom, 2170
RADAR
  medical considerations of exposure to, [Barron & Baraff] *1194
RADIATION
  cystitis, [Pool] *854
  effects of relatively low amounts on bodily function, U. of Tennessee study, 1561
  hazard, A. M. A. resolution on, 70
  hazards, United Kingdom, 2049
  in mother during pregnancy, leukemia in infant due to, United Kingdom, 314
  ionizing, A. M. A. *ad hoc* Committee on, 56; 1059; [Medicine at Work] 1370
  leukemia from, factor in thymus predisposes mice to, United Kingdom; 312
  neoplasms after, United Kingdom, 2295
  Nuclear: See Atomic Energy
  report on, United Kingdom, 926
  therapy center, Conn., 1665
  therapy for cancer of cervix, 397 cases, [Frick] 2313—ab
  therapy in carcinoma of pancreas, [Billingsley] 1725—ab
  therapy, value in inoperable bronchogenic carcinoma, [Sicher] 353—ab
  therapy with surgery in malignant melanoma,

- RADIO
  - A. M. A. activities, annual reports, 1050; 1077
  - A. M. A. award to CBS for broadcasts of San Francisco meeting, (photo) 193
  - "On Call to a Nation," celebrated 10th anniversary of National Health Service, United Kingdom, 2296
  - stations, high-power, health hazard from, *United Kingdom*, 2174
- RADIOACTIVE: See also Atomic Energy; and under individual chemical elements as Iodine
  - fall-out, Norway, 922
  - fall-out protection, [Medicine at Work] 769; 779—E
  - heparin, synthesis and metabolism of, [Elber] 1159—ab
  - interstitial implantation for primary bronchogenic carcinoma, [Henschke] 351—ab
  - isotopes for giant follicular lymphoblastoma, [Lawrence] 443—ab
  - radioactivity in milk, 914
  - seeds, pituitary ablation by means of, WHO report, 1397
  - water, Atomic Energy Commission to lease or sell, 301
  - water, heavy, excretion, 362
- RADIOLOGISTS
  - life expectancy among, United Kingdom, 311
  - shortage of, Norway, 1572
- RADIOLOGY
  - *fellowships in radiological physics, 1563*
  - research grants and fellowships, 79; 1245
- *RADIUM*
  - parenterally and orally administered, 779—E
  - poisoning, where are cases of, [Clark] *761; 779—E; (reply: teeth changes as signs of) [Dalitsch; Clark] 1929—C
  - therapy for cervical carcinoma, pseudoneoplastic changes of vesical mucosa after, [Natale] 349—ab
- RAUDIXIN; Rauloydin; Raupina; Raurine; Rauserpa; Rauwiloid: See Rauwolfia serpentina
- RAUWOLFIA SERPENTINA (alseroxylon; rauwolfia; reserpine)
  - effects of reserpine on alimentary tract, New Zealand, 432
  - toxicity: gynecomastia, explanation of, 136
  - treatment (combined), antihypertensive agent, [Roberts] 1946—ab
  - treatment of advanced psychoses, [Norman] 955—ab
  - *treatment of hypertension*, potentiate with chlorothiazide, [Rochelle & others] *410
- von RECKLINGHAUSEN'S DISEASE: See Neurofibromatosis
- RECTUM
  - biopsy in diagnosis of amebic colitis, [Juniper] 127—ab
  - cancer, metastases in pelvis, treatment, 472
  - cancer of rectosigmoid and, anterior resection for, 5-year survival, [Mayo] 114—ab
  - opening, failure of migration as cause of imperforate anus, [Bill] 116—ab
  - prolapse, occurrence in cystic fibrosis of pancreas, [Kulczycki] 1699—ab
  - surgery, transverse incision in abdominal surgery of, [Trimpi] 2307—ab
  - *tumors, lymphoid polyps, [Holtz] 115—ab*
- REDDICK, ROBERT H., psychiatrist convicted *for licensing naturopaths, etc., 1064*
- REFLEX
  - irritability, evaluation of newborn infant, [Apgar & others] *1985
  - stretch, factor in syncope in healthy young adults, [Dermksian & Lamb] *1200
- REFSUM'S SYNDROME: See Ataxia, hereditary
- REHABILITATION
  - A. M. A. Committee on, annual report, 1064
  - cardiac; cardiologists' opinions, [Williams] 962—ab
  - community services more practical than a center, [Medicine at Work] 1368
  - consultation service, recommend A. M. A. approve project and urge implementation, 56
  - in long-term respiratory paralysis, [Neu] *1610
  - institute, Kenny Foundation moved in-patient *facilities to, Mich., 2157*
  - methods used in whiplash injuries, [Seletz] *1750
  - New York U. created center for services, 295
  - plan for national action, Canada, 1922
  - research, joint efforts of New York U. and Institute for Crippled and Disabled, 1560
  - service, factors to be considered in planning, [Wallace & Kottke] *2253
  - training grant to Creighton U., 419
  - units, expansion sought in state societies, [Medicine at Work] 1368
  - vocational office, contributions to medical education and research, 1530
  - Washington, D. C. study links medicine with other groups, [Medicine at Work] 1368
- RELIGION
  - healing by clergymen, United Kingdom, 2171
  - outpatient pastoral counseling in medical center, [Young & Patrick] *24
  - unforgivable sin, what is it? (replies) [Liefeld; and original consultant] 228
- REPOSITORY, central, of medical credentials, 1070
- REPRODUCTION: See Pregnancy; Sterility
- RESCINNAMINE: See *Rauwolfia serpentina*
- RESEARCH
  - A. M. A. Committee on, annual report, 1060
  - basic and medical, activities of National Science Foundation, 1529
  - contributions of Office of Vocational Rehabilitation to, 1530
  - grants by Research Corporation, 2033
  - grants from Rockefeller Foundation, India, 1681
  - grants to U. of Mississippi School of Medicine, 1240
  - highlight of Education Congress, [Medicine at Work] 1899
  - longitudinal, implications in fitness programs, [McCammon & Sexton] *1440
  - medical, advancement through Department of Health, Education, and Welfare, 1483
  - medical, Donner fellowship winners, 78
  - medical, established by National Fund for Medical Education, 200
  - medical, National Society for, functions of, 1489
  - Navy program, 1541
  - on human factors of aerial warfare, [Stapp] *1744
  - USPHS grants, (awarded in July and August) 1248; (educational values) 1525; *(in metabolic disease)* 1915
- RESERPINE; RESERPOID: See Rauwolfia serpentina
- RESIDENTS AND RESIDENCIES
  - Air Force training program, 1542
  - A. M. A. annual report on, 1093
  - Army program, 1537
  - compensation of residents in V. A., 1533
  - Council report on approved residencies, 58
  - draft status of residents, 1534
  - limitation of exemption for residents, from payment of dues, A. M. A. resolution on, 66
  - Naval training programs, 1540
  - new programs at U. of Washington, 296
  - **number, approved residencies, annual report and directory, Oct. 4, 561; 695—E**
  - pediatric fellowships, 1244
  - residency aspects of medical education, 1476
  - Residency Review and Conference Committees, 526
  - revision of essentials of residency training, annual report, 1093
  - stipends (maximum) in Selective Service, 1533
  - U. of Michigan exchange program, 791
  - urology training, essentials for, annual report, 1099
- RESINS
  - cation exchange, azure A, in tubeless gastric analysis, [Rosenthal & Buscaglia] *409
- RESPIRATION
  - artificial, for rescue work, expired air method, A. M. A. resolution on, 67
  - artificial, for respiratory insufficiency, France, 432
  - artificial, mouth-to-mouth method, annual Council report, 1059
  - basic techniques, conditioning program for asthmatic children, [Scherr & Frankel] *1996
  - breath tests, legal validity, Canada, 2290
  - effect of air flow resistance on ventilation and respiratory muscle activity, [Fink & others] *2245
  - evaluation of newborn infant, [Apgar & others] *1985
  - factor in syncope in healthy young adults, *[Dermksian & Lamb] *1200*
  - hyperventilation syndrome, [Calvo Melendro] 1266—ab
  - maneuvers without syncope, cardiac arrhyth*mias in, [Dermksian & Lamb] *1623*
  - manual and mechanical control of ventilation during cyclopropane anesthesia, [Wester & others] *2249
  - mouth breathing indication for adenoidec*tomy? 362*
  - regulation, abnormalities in poliomyelitis, [Plum] 2067—ab
- RESPIRATORS
  - for acute intermittent porphyria with respiratory paralysis, [Doll & others] *1973
  - patients in, prevent urinary calculi after paralytic poliomyelitis, [Plum] *1302
- RESPIRATORY TRACT
  - acidosis, clinic on recognition and management of, (illustrated film review) [Smart & others] *2054
  - disease, acute, in Royal Air Force, 1683
  - disease, fellowships for study in, 912
  - disease in children, epidemic; effect of influenza immunization on, [Glazier] 460—ab
- RESPIRATORY TRACT—Continued
  - disease, therapy, hazards, *[Sherman] *1868*
  - effect of air flow resistance on ventilation and respiratory muscle activity, [Fink & others] *2245
  - granuloma, giant-cell, [Walton] 1404—ab
  - house-dust allergy, major clinical entity in pediatrics, [Mande] 1720—ab
  - infection, acute, treatment in infants, [Nis*bet] 2317—ab*
  - infection, repeated bronchoscopy for? 2083
  - insufficiency, artificial respiration for, France, 432
  - insufficiency, postoperative, tracheotomy for, [Wassner] 1407—ab
  - lower, acute virus infections in children and Stevens-Johnson syndrome, [Hölscher] 959—ab
  - paralysis, acute intermittent porphyria with, [Doll & others] *1973
  - paralysis, long-term, rehabilitation in, [Neu] *1610
- RESTENIL: See Meprobamate
- RESUSCITATION: See also Respiration, artificial
  - successful, in acute myocardial infarction with ventricular fibrillation, [Bloomfield] 330—ab
- RETICULOSARCOMA
  - leukocyte sedimentation rate in, [Bellesia] 2075—ab
- RETINA
  - angiomatosis (Hippel's disease), 11 years after diathermy coagulation, [Vail] 2322—ab
  - cancer, metastatic, [Kennedy] 1283—ab
  - chorioretinal burns *produced by atomic flash*, (guest editorial) [Byrnes] 788—E
  - detachment, report on, Belgium, 919
  - hemorrhage, relation to sulfonylureas in diabetes, 2208
- RETINITIS
  - [illegible] Refsum's syndrome,
  - studies on patients
  - -ab
  - American plan, A. M. A. action on, 56
  - experiments to provide voluntary health insurance after, (Bureau article) [Polner] *194
  - Jenkins-Keogh Bills: See Jenkins-Keogh Bills
  - pre-retirement financing or "paid-up" health insurance, annual report, 1116
- RETROLENTAL FIBROPLASIA
  - association with mental defect, [Williams] 2074—ab
- RETROPERITONEUM
  - fibrosis, idiopathic; involving ureters, aorta, and inferior vena cava, [Hackett] 1707—ab
- Rh FACTOR: See also Hemolytic Disease of Fetus and Newborn
  - change without previous blood transfusion or previous pregnancy? 1833
  - desensitize Rh-negative mother with a haptene? 2207
  - incompatibility, fetal salvage, [Bowman] 339—ab
- RHABDOMYOSARCOMA
  - in growing skeleton,
  - See Heart disease
  - inflammation
  - between, France, 91
  - medullary iron in,
  - focus in, [Domelj]
  - [illegible]
  - institute for, at Bellevue Medical Center, 2278
  - prevent by treating streptococcal infections, *factors responsible for failures, [Catanzaro]* 940—ab
  - prevent recurrences, United Kingdom, 435
  - recurrent, prophylaxis with oral phenoxy*methyl penicillin*, [Kaplan] 1941—ab
  - treatment, manifestations following cessation of, [Fischel] 1696—ab
- RHEUMATISM
  - *exhibit on, award for, 903*
  - International Award AQUI TERME of Rheu*matology, 1246*
  - primary, traumatism in pathogensis of, *[Schiavetti] 1576—ab*
  - specific pathogen of, [Zalessky] 967—ab
  - treatment: cortisone, Sweden, 1394
  - treatment: Pyracortine, India, 2043
- RHINITIS
  - allergic: See Hay Fever
- RHUS
  - prophylaxis of, 979
- RIMIFON: *See Isoniazid*
- RINGWORM
  - experimentally induced in guinea pigs, griseofulvin for, United Kingdom, 810
  - scalp, non-inflammatory, effect of oral steroid for, [Kanof] 2318—ab

RISTOCETIN
  N. N. D., 183
  toxicity, hematologic, relation to dose, [Gangarosa] 1582—ab
  treatment of staphylococcic endocarditis, [Weber] *1316
ROCHESTER, N. Y. Health Forum, public relations using television, [Townsend & Steinhausen] *1983
ROCKY MOUNTAIN SPOTTED FEVER
  4 cases, Ark., 699
ROENTGEN RAYS
  Chest x-rays: See Thorax, chest x-rays
  conventional medical films during nuclear warfare, [Nitka] 130—ab
  criteria for in differential diagnosis of tuberculomas, [Oliva] 1725—ab
  diagnosis of basilar artery insufficiency, [Crawford & others] *509
  diagnosis of traumatic aneurysm of thoracic aorta, [Steinberg] 973—ab
  first annual Symposium on Cinefluorography, N. Y., 700
  "flat film" of abdomen, what does it mean? (reply) [Lamm] 1151—C
  sign in hemosiderosis, [Shanbrom & Zheutlin] *33
  technicians, schools for, 1546
ROMICIL: See Oleandomycin
ROXINIL; ROXINOID: See Rauwolfia serpentina
ROYAL
  Air Force, acute respiratory disease in, 1683
  Society of Medicine, Council, Rockefeller grant to, 2296
RUBBER BAND tourniquet for hemostasis in preserving renal function during partial nephrectomy, [Goodwin & Thelen] *179
RUBELLA
  neutralizing antibody in gamma globulin, reevaluation of rubella problem, [Krugman] 1281—ab
  rubelliform rash, isolate ECHO virus in aseptic meningitis with, [Sultanian] 132—ab
RUBEOLA: See Measles
RUNNING
  pyodermia in runners, Sweden, 211
RURAL COMMUNITIES
  annual report of Council on Rural Health, 1054
  coronary disease in, United Kingdom, 315
  health advisors, expanding challenge told by, [Medicine at Work] 776
RUSSIA
  American medical exchange program, 201
  neurologists' exchange mission to, 2284
  new drugs for potentiated anesthesia, [Kazansky] 1824—ab
  Russian vaccine for multiple sclerosis, United Kingdom, 311

S

ST. LOUIS UNIVERSITY
  research grant in microbiology and virology, 1240
SAINT'S TRIAD
  cholelithiasis, hiatus hernia, and diverticulosis coli, [Foster & Knutson] *257
SALAMIDE: See Salicylamide
SALICYLAMIDE
  toxicity and antipyretic activity of acetylsalicylic acid compared, (replies) [Woodbury] 1259—C; [Bass] 1684—C
SALICYLATES
  problems, [Cann] 1577—ab
SALIVA
  excessive, in Parkinsonism, treatment, 138
  ptyalism, treatment, 2204
SALIVARY GLANDS
  tumor, treatment, 2333
SALK VACCINE: See Poliomyelitis
SALMONELLOSIS
  in premature nursery unaccompanied by diarrhea, [Watt] 2316—ab
  outbreak in hospital, Denmark, 707
  samonella carrier, treatment, 135
  unusual Salmonella, [Balows] 1827—ab
SALPINGITIS
  acute, prognosis and treatment, [Hedberg] 1162—ab
  tuberculous, treatment, [Rydén] 1161—ab
SALT: See also Sodium chloride
  Free diet: See Sodium restricted diet
  role in fall of blood pressure accompanying reduction in obesity, [Dahl] 322—ab
SANATORIUM: See Tuberculosis of Lung
ANDRIL: See Rauwolfia serpentina
ANGER, F., Nobel Prize winner for Chemistry, United Kingdom, 2296
SANITATION
  engineering, India, 1258
  environmental, India, 707
SARCOIDOSIS
  Boeck's, tuberculosis antibodies in, [Müller] 1288—ab
  of spinal cord, remission after cortisone therapy, [Moldover] 2182—ab
SARCOMA
  Ewing's relationship of trauma to cause or aggravation of, 135
  gastric, Brazil, 1150
  Kaposi's, superimposed on erythroderma psoriaticum, [Segal] 465—ab
  mammary, [Botham] 711—ab; (Brazil) 802
  osteogenic, of jaws and facial bones, [Kragh] 2301—ab
SCALP
  ringworm, non-inflammatory, oral steroid for, effect of, [Kanof] 2318—ab
SCHILLING TEST: See Anemia, Pernicious
SCHISTOSOMIASIS
  Brazil, 2167
  possible, from swimming in ocean, (replies) [Schaefer; and original consultant] 1838
  swimmers' itch, treatment, 363
SCHIZOPHRENIC REACTIONS
  cerebrospinal fluid neuraminic acid deficiency in, [Bogoch] 1411—ab
SCHOLARSHIPS
  allergy, by Allergy Foundation of America, 298
  health museum, Ohio, 1141
  neuromuscular, from Kenny Foundation, 1561
  "performance" awards, 1519
  utilization of, 1957-1958, 1518
SCHOOLS
  boards, physicians on, W. Va., 911
  day, epidemic of tuberculosis of lung in, United Kingdom, 810
  driver education in motor vehicle accident prevention, [Neyhart] *2209
  for medical record librarians, 1543
  for medical record technicians, 1544
  for medical technologists, 1544
  for occupational therapists, 1545
  for physical therapists, 1546
  for x-ray technicians, 1546
  Health Award to Dr. Bauer, 1663
  high, atomic energy demonstration program, 797
  of basic sciences, approved in U. S., 1490
  of basic sciences, functions and structure of, recommend adoption, reports on, 1089; 1096; 1470
  of nursing, accreditation program, report on, 58
  personnel, chest x-rays for, 2080
  physicians and, national conference on, annual report, 1079
  tuberculosis epidemics in, [Mande] 1715—ab
SCHOOLS, MEDICAL: See also specific schools
  affiliation, internships by, 523; 521; 553
  Alumni: See Graduates
  contributions to, annual reports, 1119; 1120
  essentials of acceptable school replaced by functions and structures, annual report, 1089
  faculty awards, nominations for, 79
  faculty positions unfilled in U. S., 1494; 1495; 1548—E
  medical practice liaison, 1232
  new, first graduates, Colombia, 1391
  new, potential sites, annual report, 1090
  proposed, agreement on, Ariz., 1139
  purpose of, 1548—E
  statistics on, education number, Nov. 15, 1459; 1489
  studies and accreditation, annual report, 1089
  U. S., Chilean visits, 2280
SCIENCE
  fair exhibits, awards for, 903; (annual reports) 1051; 1073
  writing workshops, annual report on, 1052
SCISSORS, bandage, new, [Burnham] *760
SCLERODERMA
  functioning carcinoid syndrome associated with, [Zarafonetis] 940—ab
  generalized, long-term prednisone in, [Kanee] 1812—ab
  Werner's syndrome, autopsied case, [Perloff] 325—ab
SCLEROSIS
  hereditary, spinal form, ACTH or corticosteroids for? 1957
SCLEROSIS, MULTIPLE
  alopecia of beard with, 1423
  is it a spirochetosis? [Simons] 955—ab
  negative bacteriologic and serologic results on reexamination of problem of mycobacterial etiology, [Bauer] 1410—ab
  pain in tongue in, treatment, 843
  Russian vaccine for, United Kingdom, 311
  16 patients, India, 1150
  treatment: hydrocortisone and vitamin B_6, [Reyes Oliveros] 220—ab
SCOLIOSIS: See Spine curvature
"SCRAP IRON" intoxication, [Gadsden & others] *1220
SCROTUM
  filariasis of, India, 1682
SCURVY
  statistics on, India, 1570
SEAMEN
  blood transfusions in Merchant Marine, Netherlands, 2045
SEBORRHEA
  pemphigus seborrheicus, [Chargin] 1163—ab
SEDATIVES AND HYPNOTICS
  anileridine hydrochloride as, [Therien & others] *2098
  from Vinca rosea, hypotensive, India, 1799
  promethazine in obstetrics, [Carroll & Moir] *2218
  treatment of tetanus, [Miller & Stoelting] *393
SEMEN
  bloody, usually found in nonspecific epididymitis? 1833
  coloring of, cause, 2207
SEMINAL VESICLES
  chronic vesiculoprostatitis: reorientation, [Leader] *995
SENEAR-USHER SYNDROME: See Pemphigus
SENSATION
  hyperexcitability of pulmonary endings in asthma, [Tiffeneau] 1588—ab
SEPTICEMIA
  of newborn, [Nyhan] 1716—ab
  Staphylococcus albus, in mice and men, [Smith] 2179—ab
SERENDIPITY
  there's that word again, [Medicine at Work] 1899
SEROMYCIN: See Cycloserine
SEROTONIN (5-hydroxytryptamine)
  secreting, functioning carcinoid, diagnosis and clinical management of, [Sauer & others] *139
SERPASIL; Serpiloid; Serpina: See Rauwolfia serpentina
SERUM: See also subheads under Blood
  Hepatitis: See Hepatitis, Infectious
  horse, desensitization against, 843
  stored, laboratory tests with, 1734
SEWELL, MRS. CHARLES W., A. M. A. distinguished service citation to, 53; 1054
SEWER GAS exposure over a period of 2 years, pathologic effects of, 716
SEX
  chromatin in cell nucleus after hormones for mammary carcinoma, [Ehlers] 1161—ab
  determination, chromatic mass in nuclei of somatic cells, India, 1924
  determination, chromosomal, theoretical and practical questions, [Zdansky] 1719—ab
  distribution of students and graduates in U. S. and Canada, 1506
  genetic, determination, reliability of polymorphonuclear leukocyte morphology, [Cooper] 831—ab
  Hormones: See Androgens; Estrogens; Hormones
  Intersexuality: See Hermaphroditism
  medical students and sexology, United Kingdom, 2048
  Precocity: See Puberty
  problems in chronic vesiculoprostatitis, a reorientation, [Leader] *995
  Society for Scientific Study of Sex, first annual conference, N. Y., 1241
SHELLFISH
  allergy to hard-shelled clams, 982
  injury due to venomous marine snails of genus Conus, [Kohn] 1702—ab
  poisoning, epidemic, (Canada) 431; [Bond] 975—ab
SHIGELLA
  drug resistance in, Israel, 95
  sonnei dysentery epidemic in general hospital, [Ehrenkranz] 1726—ab
SHIPS
  venereal disease treatment at sea, Sweden, 1801
SHOCK
  care of patient with multiple injuries, [Aufranc] *2091
  in myocardial infarction, drugs for, (Council report) [Selzer & Rytand] *762
  septic, nature and treatment, [Altemeier] 2198—ab
  traumatic, physiopathology, [Laborit] 840—ab
SIBLINGS: See Families
SICKLEMIA; SICKLING: See Anemia, sickle cell
SIGMAMYCIN: See Signemycin
SIGNEMYCIN
  in pediatrics, [Felder] 2318—ab
SILICA exposure after tuberculosis, 2330
SILICOSIS: See Pneumoconiosis
SILICOTUBERCULOSIS
  results of medical and medical-surgical therapy, [Morrow] 2298—ab
"SILO-FILLER'S DISEASE"
  chronic, [Schell] 963—ab
SILVER
  nitrate vs. oxytetracycline in newborn eyes, incidence of conjunctivitis after, [Mathieu] 121—ab
SIN, unforgivable, what is it? (replies) [Liefeld; and original consultant] 228
SINTROM: See Acenocoumarol
SINUSITIS, Brazil, 1677
SITOSTEROLS
  blood cholesterol and difficul[illegible] decholesterolizing a[illegible]

- SKELETON: See Bones
- SKIN
  - absorption of calories, 1169
  - changes as result of electric current, [Winer] 2073—ab
  - coverage in children, lower extremity, [Wynn] *154
  - Disease (Industrial): See Industrial Dermatoses
  - disease, National Foundation for Research in Cutaneous Medicine established, 1144
  - disease, progressive pigmentary, treatment, (replies) [Benedek; and original consultant] 1594
  - grafts for third degree burns, remove granulations to firm yellow base? 134
  - hypopigmentation following planing, how can one get an even suntan? 361
  - in arthroplasty, use of, Finland, 308
  - Inflammation: See Neurodermatitis
  - Planing: See Planing
  - reactions to sulfamethoxypyridazine, [Lindsay] 2073—ab
  - symposium on human integument, proceedings to be published, 1062
  - vesicular and bullous disease, treatment, 982
- SKULL: See Cranium
- SLEEP
  - position in infant, flattening of one side of head, treatment, 135
  - position of children, especially lying on stomach, 1592
- SMALLPOX
  - antivaccinal gamma globulin, United Kingdom, 2048
  - *in Pakistan, 1386*
  - osteoarticular lesions in, India, 1255
  - revaccination contraindicated after generalized vaccinia, 979
  - vaccination, eczema vaccinatum, [Reynolds] 1716—ab
  - vaccination, "immune" or "no take" reaction in, 1900—E
  - vaccination, immunology, mechanism of, 2334
  - vaccination, Sweden, 1801
- SMEGMA, possible role in carcinoma of cervix, [Heins] 2312—ab
- SMELL
  - loss of, after head injury, 1423
- SMITH, AUSTIN, Journal editor, resigns, resolution commending him, 2150
- SMOKERS; SMOKING: See Tobacco
- SNAILS
  - cone shell stings, [Kohn] 1702—ab
- SNAKEBITE
  - coral snakes, treatment, 1425
  - treatment, 980
- SOCIAL CONDITIONS
  - biological false-positive serologic tests for syphilis in low socioeconomic group, [Waring & others] *2004
  - pediatrics in transition due to, [Wheatley] *856
- SOCIAL SECURITY
  - Act, optometrists want amendment to, 2 letters from Dr. Blasingame to Congress regarding, *291, 292*
  - Administration's disability evaluation, 2284
  - A. M. A. resolution on disability program, 67
  - bargain or bust, [Marin] 1803—C
  - coverage for physicians, (A. M. A. resolution on) 65; 66; (report) 1051
  - for physicians, Ohio poll to be sent to A. M. A., resolution on, 2150
  - Forand Bill: See Forand Bill
  - missiles or pensions, (Miscellany) [Orr] *1686
  - state participation in federal insurance contribution act, A. M. A. resolution on, 64
- SOCIALISM
  - health services reviewed, New Zealand, 1570
  - welfare state down under, (Miscellany) [Hotchkiss] 933
- SOCIETIES, MEDICAL: See also list of Societies at end of letter S
  - American Association of Poison Control Centers formed, 2159
  - American Hospital Association dedicated new headquarters, 298
  - American Psychiatric Association dedicates office building, 2160
  - Bockus International Society of Gastroenterology organized by graduate alumni of U. of Pennsylvania, 1560
  - Boston Psychoanalytic Society and Institute, 25th anniversary, 2157
  - conference calls for action in aging, [Medicine at Work] 769; 779—E
  - constituent, resolution on listing by A. M. A., 71
  - county, civil defense conference, (program) 906; (annual report on) 1071; (highlights) [Medicine at Work] 1897
  - Dane County Medical Society co-sponsors symposium on bone, (Program) 520
  - establish sovereignty of relationships with osteopaths, disapprove resolution on, 2150
  - local, participation in by physicians in other groups, [illegible] 58; 1069
- SOCIETIES, MEDICAL—Continued
  - local, planning for indigent care is obligation, [Medicine at Work] 1893
  - Medical Society of New York moved offices, 419
  - national associations and A. M. A., joint meetings, resolution on, 68
  - offer prizes to teenagers for high scholarship, [Medicine at Work] 1891
  - Oregon Trudeau Society organized, 2159
  - responsibility in veterans medical care, annual report, 1103
  - Society for Scientific Study of Sex, first annual conference, N. Y., 1241
  - Southern Medical Association opens new headquarters, (photo) 1668
  - state committees on industrial health, joint conference with, annual report on, 1066
  - state, Conference of Mental Health Representatives, (how contagious is mental illness?) [Medicine at Work] 773; (annual report) 1053
  - state, expansion of rehabilitation units sought in, [Medicine at Work] 1368
  - state, traffic safety committees, objectives for, [Rodger] *2215
  - state, use of official stamp by A. M. A., resolution on, 71
  - suggested guides for committees on aging approved, 59; 1102
  - suggested guides for voluntary prepayment plans sponsored by, action on, 59; 1116
  - 2 in Minnesota aim at home care for chronically ill, [Medicine at Work] 1894
- SOCIETY for Relief of Families of Deceased, Disabled and Indigent Members of Medical Profession of South Carolina created, [Smith] 1684—C
- SOCIOLOGY of Medical Education, introductory studies in, 1467
- SODIUM
  - Chloride: See also Salt
  - chloride plombage to prevent complaints after lumbar puncture, [Harrer] 1712—ab
  - dietary, role in essential hypertension, [Dahl] 323—ab
  - phosphate, tribasic, contaminant in needles and syringes used for spinal anesthesia, [Joseph & Denson] *1330
  - restricted diet, booklets, annual report, 1059
  - restricted diets, physiological adaptation and clinical usefulness, (Council report) [Danowski] *1886
- SOLUSEPTASINE
  - effect on blood sugar, India, 1257
- SOUTHERN Regional Education Board and medical education, 1487
- SOVIET UNION: See Russia
- SPACE
  - address on conquest of, Pa., 199
  - Medicine: See Aviation
  - *national program, annual report of Council* on National Defense, 1071
- SPASM
  - training center for spastics, United Kingdom, 2175
- SPEAKERS *bureau, Chicago Medical School* organizes, 294
- SPECIALTIES
  - American boards, requirements for certification, annual report, 658
  - approved residencies and fellowships according to, 527; 561; 694—E
  - highlight of Education Congress, [Medicine at Work] 1899
  - new "doctor-draft" legislation provides for, 1535
- SPEECH
  - changes in intoxication, (Committee report) [Bogen] 48
  - personality characteristics relationship, U. of Cincinnati study, 1560
- SPERMATOZOA
  - cytometer chamber spermatocidal test, improved technique, [Berberian & Slighter] *2257
  - human, succinic dehydrogenase in, India, 94
- SPHINCTER MUSCLES
  - gastroesophageal, jejunal interposition operation, [Thomas & Merendino] *1759
- SPINAL CORD
  - injuries, neurosurgical care of severely injured patient, [Odom] *2087
  - sarcoidosis: cortisone for, [Moldover] 2182—ab
- SPINAL FLUID: See Cerebrospinal Fluid
- SPINAL PUNCTURE
  - headache, technique to avoid, [Brocker] *261; (correction) 913
  - lumbar, sodium chloride plombage to prevent complaints after, [Harrer] 1712—ab
- SPINE
  - arthritis, treatment, 843
  - cervical, rheumatoid arthritis in adult, [Sharp] 2303—ab
  - curvature, kyphoscoliosis and pregnancy, [Marchand] 2314—ab
  - curvature, Milwaukee brace in operative treatment of scoliosis, [Blount] 327—ab
- SPINE—Continued
  - curvature, treatment of scoliosis, follow-up, [Risser] 328—ab
  - pathogenetic importance of thoracic portion, [Kamieth] 1586—ab
- SPIRAMYCIN
  - treatment of chronic osteomyelitis, [Marchis] 126—ab
  - treatment of experimental toxoplasmosis, [Garin] 835—ab
- SPIROCHETOSIS
  - *is multiple sclerosis?* [Simons] 955—ab
- SPLEEN
  - primary splenic pancytopenia, effect of splenectomy on, [Tapie] 2188—ab
  - radiologic sign *in hemosiderosis*, [Shanbrom & Zheutlin] *33
  - role of, and effect of splenectomy in sickle cell disease, [Sprague] 224—ab
  - rupture in infant during delivery, hematologic study during convalescence, [Hottinger] 461—ab
  - splenoportography, advantages and disadvantages, [Figley] 973—ab
- SPLENECTOMY: *See also* under Spleen
  - for leishmaniasis, India, 1798
  - life span after, 1837
- SPLENOMEGALY
  - hepatosplenomegaly in children, Brazil, 1254
  - postmalarial, India, 1680
- SPONGE
  - gauze smear technique in esophageal cytology, [Hershenson & others] *1871
- SPONTIN: See Ristocetin
- SPORTS: See Athletics; and under specific *sports, as Boxing*
- SPUTUM
  - viscosity, reduction by desoxyribonuclease and chymotrypsin, United Kingdom, 2173
- STALVEY, RICHARD, leaves A. M. A. to be Assistant Executive Director of Los Angeles County Medical Association, 695
- STAMPS: See *Postage Stamps*
- STANFORD UNIVERSITY SCHOOL OF MEDICINE
  - first Bloomfield Professor of Medicine, 2155
  - new genetics department at, 197
- STAPHYLOCOCCUS
  - albus septicemia in mice and men, [Smith] 2179—ab
  - antibiotic resistant familial infections caused by exposure of babies in hospital nurseries, [Hurst] 1826—ab
  - antibiotic-resistant, outbreaks in medical and surgical ward, [Barber] 945—ab
  - aureus, importance in pneumonia in influenza epidemic, [Robertson] 1585—ab
  - aureus, nasal carriage by nurses, [Thompson] 969—ab
  - aureus, pulmonary, eventually lethal after Asian influenza, treatment, [Moeschlin] *1158—ab*
  - disease, regional conference on control, Colo., 1557
  - empyema, [Magovern & Blades] *365; (in children) [Sia] 1412—ab
  - endocarditis treated with ristocetin, [Weber] *1346
  - enteritis and antibiotics, Sweden, 1395
  - furunculosis, chronic, recurrent, 842
  - infection, maternal breast abscesses and antecedent neonatal sepsis, [Monro] 1275—ab
  - infections, bacteriophage treatment, 1423
  - infections in nursery, prevention of, 2204
  - infections, isolation of patients with, 716; (replies) [Rolf; and original consultant] 2208
  - meningitis, novobiocin for, [Giusti] 337—ab
  - penicillin-resistant, Denmark, 919
  - pneumonia in infancy and childhood, (75 cases) [Hendren & Haggerty] *6; (cortisone for) [Bühler] 222—ab
- STARCH tolerance test, clinical evaluation, [Nugent & Millhon] *2260
- STATES
  - activities and gifts of American Medical Education Foundation, 1119, 1120
  - financing of medical care for indigent in *1958, (Council report) 2151*
  - governments, council of, annual report on, 1103
  - internships by, 523; 524
  - legislative keyman organization, annual report, 1048
  - licensing boards, foreign physicians licensed by, *167:622*, May 31, 1958; (correction) *168:2161, Dec. 20, 1958*
  - participation in Federal Insurance Contribution Act, A. M. A. resolution on, 64
  - populations, ratio of first-year students to, 1510
  - state operated diagnostic center, Canada, 431
- STATISTICS: See also Vital Statistics
  - postdoctoral study in at U. of Chicago, 297
- STEIN-LEVENTHAL SYNDROME
  - curable form of sterility, [Stein] 1714—ab
- STERANE: See Prednisolone acetate

STERILITY, SEXUAL
  curable form: Stein-Leventhal syndrome, [Stein] 1714—ab
  endocervicitis and, Brazil, 802
  in male, retrograde ejaculation as cause of, [Schellen] 1578—ab
  in primary failure of anterior pituitary, cobalt radiation of value? 1732
  infertility and, medical views, [Cohen] *1963
  serum cholesterol level and, 980
  surgical management of tubal factor, [Cauwet] *991
STERILIZATION, BACTERIAL
  heat, of local anesthetics a necessity? [Bridenbaugh & Moore] *1331
  of electric clippers and barber's tools, 362
STERILIZATION, SEXUAL
  therapeutic, and testosterone propionate for breast cancer, [Nogués] 713—ab
STEROIDS: See Corticosteroid Hormones: and specific steroids as Cortisone
STEROSAN: See Chlorquinaldol
STEVENS—JOHNSON SYNDROME: See Erythema multiforme
STILBESTROL: See Diethylstilbestrol
STILLBIRTH
  fetal salvage in Rh incompatability where previous stillbirths have occurred, [Bowman] 339—ab
STIPENDS: See Wages
STOKES-Adams Syndrome: See Heart block
STOMACH
  analysis, tubeless, (India) 210; [Rosenthal & Buscaglia] *409
  cancer after resection for ulcer, [DeBray] 825—ab; [Cole] 1160—ab
  cancer in Hiroshima, [Murphy] 469—ab
  cancer, prognosis, [Deuck] 1408—ab
  cancer, study, N. Y., 2158
  cancer, treatment, end-results, [McNeer] 331—ab
  cardiomyectomy: surgery of cardiospasm according to Heller, [Schmidt] 418—ab
  exfoliative cytology, Brazil, 1251
  gastroesophageal mechanism, experimental studies, [Meiss] 1290—ab
  granulomatous disease, nonspecific, [Goldgraber] 819—ab
  inflammation, severe chronic, surgical treatment, [Judd] 111—ab
  lower esophageal ring, pathology, [MacMahon] 968—ab
  moniliasis, [Tinajero Ayala] 940—ab
  perforation, idiopathic, in newborn, [Castleton] 111—ab
  sleeping positions of children, 1592
  Surgery: See also Peptic Ulcer; and other subheads under Stomach
  surgery, anemia after subtotal gastrectomy, [van Geertruyden] 217—ab
  surgery, dumping syndrome after, 1229—E
  surgery, gastrectomy, drainage after, 716
  surgery, Palfium after, Sweden, 708
  surgery, partial gastrectomy; hyperdiastasuria and acute pancreatitis after, [Wallensten] 1708—ab
  surgery, resection and pulmonary tuberculosis, [Neubert] 2306—ab
  surgery, total gastrectomy technique, Portugal, 310
  tumors, hemangioendothelioma of, [Andreassen] 825—ab
  tumors, leiomyosarcoma of, [Mason] 2183—ab
  tumors, sarcoma, Brazil, 1150
  Ulcer: See Peptic Ulcer
STONES, precious, [Leisure Corner] 1261
STORAGE
  of liquid plasma, safety after, [Sayman & others] *1735; 1784—E
STREPTOCOCCUS
  infection, penicillin for, compare oral and parenteral forms, [Breese] 1283—ab
  infections, epidemic, mass prophylaxis with benzathine penicillin G, [Schreier] 354—ab; [McFarland] 714—ab
  infections, treatment to prevent rheumatic fever, factors responsible for failure, [Catanzaro] 940—ab
STREPTOKINASE
  buccally, clinical and experimental observations, [Innerfield] 124—ab
STREPTOMYCIN
  Dihydro—: See Dihydrostreptomycin
  sensitivity of mycobacteria isolated from untreated primary tuberculosis of lung to, [Spina] 1945—ab
  toxicity: dermatitis in nurses, [Wilson] 465—ab
  toxicity, hazards, [Herrell] *1875
  treatment alone or plus isoniazid in tuberculous meningitis, [Giova] 440—ab
  treatment plus ethereal oils in specific pulmonary diseases, [Liener] 468—ab
  treatment plus PAS and isoniazid in urogenital tuberculosis, [Hansson] 1720—ab
STREPTOVARICIN
  in tuberculous guinea pig, [Stern] 837—ab
STRESS
  isolation, in medical and mental illness, [Ziskind] *1427
STROKES: See under Brain
STRONGYLOIDIASIS
  overwhelming, [Brown & Perna] *1648
  treatment, Brazil, 802
  treatment: new drugs, [Asfora] 1703—ab
STRYCHNINE
  pharmacological activity, India, 806
STUDENTS, MEDICAL
  allergy awards to, 298
  education number, Nov. 15, p. 1459; 1503
  medicolegal program, annual report on, 1014
  Minnesota Multiphasic Personality Inventory and, New Zealand, 433
  senior, as clinical clerks to replace first year interns, (A. M. A. resolutions on) 65; (report) 1088
  sexology and, United Kingdom, 2048
  Sheard-Sanford prizes for research by, 1143
  Student A. M. A. award exhibits, 903; 1073
  USPHS program; Commissioned Officer Student Training and Extern Program, 425
SUBDURAL Hematoma: See Meninges
SUGAR: See also Blood sugar; Glycosuria
  cane sensitivity, information on bagassosis due to, 134
SUICIDE
  poisoning, [Norbury] 1712—ab
  prevention, iproniazid for depression and melancholia, toxicity of, 50—E; (reply) [Roble] 1802—C
SULFADIMIDIN: See Sulfamethazine
SULFAMETHAZINE
  treatment plus neomycin in infant diarrhea, India, 1256
SULFAMETHOXYPRIDAZINE
  Acetyl: See Acetyl Sulfamethoxyprydiazine
  long-acting, India, 1799
  N. N. D., 1771
  toxicity: cutaneous reactions, [Lindsay] 2073—ab
SULFONAMIDES
  Antidiabetic; Hypoglycemic: See also Sulfonylureas
  effect of Soluseptasine on blood sugar, India, 1257
  hypoglycemic, show selective tropism for pancreas, France, 803
  long-acting: Orisul, clinical experiences with, [*Esseltier*] 1722—ab
  long-acting: sulfamethoxypridazine, India, 1799
  toxicity: myocarditis, Canada, 1922
SULFONYLUREAS (*carbutamide; chlorpropamide; tolbutamide*)
  carbutamide treatment of psychiatric patients, Sweden, 211
  treatment of diabetes, (Finland) 308; (chlorpropamide, United Kingdom) 1574; [Murray] 2074—ab; [Hofstetter] 1722—ab; [Ikkala] 2196—ab; (retinal hemorrhage relation to) 2208
SULFURIC ACID
  tanks, arsine poisoning from cleaning of, United Kingdom, 311
SUNTAN
  how can one get an even one after planing with residual hypopigmentation? 361
  vitamin D, and calcium absorption, 1953
SUPRARENALS: See Adrenals
SURGEONS
  American, visit Oslo, Norway, 310
  fee, when visiting surgeon does the surgery, Canada, 431
  spinal anesthesia from standpoint of, [Scarborough] *1324
  thoracic team tours South America, Sweden, 1800
SURGERY
  cardiac arrest in, problem of, [McCarthy] *2101
  diagnosis and management of hepatic coma in surgical patients, [Najarian] 950—ab
  ethical to have another perform without patient's knowledge and consent? (Judicial Council opinion on) 1556
  hemorrhage, control with adrenochrome monosemicarbazone, [Cainan] 1160—ab
  infections, control, [Hitchcock] 2066—ab
  major, cortisone as cover for, in advanced pulmonary tuberculosis, [Edge] 2185—ab
  miniature R-wave cardiac monitor to detect cardiac arrest during, [Veling] *753
  operating room mortality, develop classification and terminology for, A. M. A. resolution on, 67
  operating room training of student nurses, A. M. A. resolution on, 68
  operating time, Germany, 1679
  oral bouillon feedings, [Benjamin] 2311—ab
  Postoperative: See also under specific organs, regions or operations
  postoperative hiccup, Belgium, 2290
  postoperative myocardial infarction, [Feruglio] 2059—ab
  postoperative period (immediate) following total body perfusion, [Matthews] 1708—ab
  postoperative respiratory insufficiency, tracheotomy for, [Wassner] 1407—ab
  Preoperative: See also under specific organs, regions or operations
SURGERY—Continued
  preoperative and postoperative use of anileridine hydrochloride as analgesic and sedative, [Therien & others] *2098
  principles in management of mass casualties, [Ziperman] 453—ab
  thoracic and thoracoabdominal, hypothermia in poor risk patients, [Brewer] 1588—ab
  tissue committee, uses and abuses, [Henley & others] *2243
  wound infection, United Kingdom, 925
SWEAT
  bromhidrosis, etiology, 1592
  excessive underarm, treatment, (replies) [Berberian; and original consultant] 363
  recurrent night, cause, treatment, 843 (replies) [Robinson; Weinberg] 2208
SWEETENERS
  artificial, prolonged use harmful? 1593
SWIMMING
  swimmers' itch and possible schistosomiasis from ocean, (replies) [Schaefer; and original consultant] 1838
  swimmers' itch, treatment, 363
SYDENSTRICKER, VIRGIL P., Goldberger award to, 53
SYMPATHECTOMY
  lumbar, effective level determined by electrical stimulation at operation, [Randall] 444—ab
SYMPOSIUM
  on competitive athletics in children, [Maksim] *1431; [Hein] *1434; [Hoxie] *1439; [McCammon & Sexton] *1440
  on drug therapy, sponsorship, annual report on, 1057
  on formation and diseases of bone, (program) (Council article) 520
  on nutrition in pregnancy, (Council articles) [Stearns] *1655; [Hepner] *1774; [Warkany] *2020; [McGanity & others] *2138; [Macy] *2265
  on occupational medicine for private practitioner, [Johnstone] *1844; [Belknap] *1847; [Keene] *1851; [Felton] *1854; [Kirkpatrick] *1864
  panel discussion on use and abuse of adrenal steroids, program, (A. M. A. symposium) 41
SYNCOPE
  congenital deaf-mutism with prolonged QT interval and, sudden death in, [Levine] 1818—ab
  experimental, cardiac arrythmias in, [Dermksian & Lamb] *1623
  in healthy young adults; incidence, mechanisms, significance, [Dermksian & Lamb] *1200
SYPHILIS: See also Neurosyphilis
  early, long-term results of treatment, [Chargin] 1163—ab
  serodiagnosis, compulsory premarital testing, epidemiologic study, 289—E
  serologic tests, biological false-positive results in low socioeconomic population group, [Waring & others] *2004
  tertiary, and yaws, method of differentiating, 2205
  training in, plea for, [Thomas] 812—C
SYRINGE
  used for spinal anesthesia, effects of detergents left as contaminants in, [Joseph & Denson] *1330

SOCIETIES AND OTHER ORGANIZATIONS

Acad.—Academy
Am.—American
A.—Association
Coll.—College
Commn.—Commission
Comm.—Committee
Conf.—Conference
Cong.—Congress
Dist.—District
Div.—Division
Found.—Foundation
Hosp.—Hospital
Indust.—Industrial
Inst.—Institute
Internat.—International
M.—Medical
Med.—Medicine
Nat.—National
Pharm.—Pharmaceutical
Phys.—Physicians
Soc.—Society
Surg.—Surgery
Surgs.—Surgeons
S.—Surgical

Note:—For items on societies not found in the Medical News Section, see alphabetical listing in Index.

Aberdeen Area M., Dental and Pharmacy Officers A., 2157
Acad. of Psychoanalysis, 1562, 1914
  of Psychosomatic Med., 299, 2282
Alabama Acad. of General Practice, 1665
  M. Alumni A. of, 1665
Alleghany County Health Department, 2156
Allergy Found. of America, 298
Allstate Safety Crusade, 76
Am. Acad. of Dermatology and Syphilology, 1563
  Acad. of General Practice, 74, 77, 297, 419, 420, 699, 792, 794, 912, 1139, 1142, 2032
  Acad. of General Practice, Comm on Education of, 418, 2156
  Acad. of General

Societies and Other Organizations—Continued

Am.—Continued

  Acad. of General Practice, Montana Chapter, 1559
  Acad. of General Practice, Nevada Chapter, 1559
  Acad. of General Practice, North Dakota Chapter, 1242
  Acad. of General Practice, South Carolina Chapter, 1243
  Acad. of General Practice, South Dakota Chapter, 199
  Acad. of General Practice, Virginia Chapter, 296
  Acad. of General Practice, West Virginia Chapter, 297, 1912
  Acad. of Neurology, 1142
  Acad. of Opthalmology and Otolaryngology, 702, 1669
  Acad. of Orthopaedic Surgs., 2280
  Acad. of Pediatrics, 422, 911, 912, 1244, 2282
  Acad. of Physical Med. and Rehabilitation, 1244
  A. for the Advancement of Science, 1557
  A. for Blood Banks, 1561
  A. for the History of Med., 200
  A. of Hosp. Accountants, 298
  A. of M. Clinics, 1383
  A. of M. Record Librarians, 298
  A. of Poison Control Centers, 2159
  A. of Public Health Phys., 1142
  A. for the Study of Neoplastic Diseases, 1563
  A. for the Surg. of Trauma, 422, 2159
  A. of University Women, 1668
  Board of Anesthesiology, 1383
  Board of Internal Med., 201, 293, 417, 913
  Board of Pediatrics, 911
  Board of Psychiatry and Neurology, 1142, 1787
  Board of Radiology, 2279
  Board of Surg., 2031
  Cancer Soc., 198, 1140, 1243
  Cancer Soc., Florida Div. of, 1385
  Cancer Soc., Massachusetts Div., 1240
  Cancer Soc., Milwaukee Chapter, 1789
  Coll. of Allergists, 1139
  Coll. of Cardiology, 1385
  Coll. of Chest Phys., 200, 298, 1143, 1241, 1790
  Coll. of Gastroenterology, 1563
  Coll. of Hosp. Administrators, 298
  Coll. of Phys., 293, 419, 1381
  Coll. of Phys., Arizona Region, 790
  Coll. of Phys., Arkansas-Oklahoma Region, 795
  Coll. of Phys., Idaho-Utah Region, 293
  Coll. of Phys., Kentucky-Tennessee Region, 795
  Coll. of Phys., Midwest Region, 300
  Coll. of Phys., New England States, Quebec, and Atlantic Provinces, 1244
  Coll. of Phys., New Jersey, 1240
  Coll. of Phys., New Mexico, 700
  Coll. of Phys., Ohio Region, 1911
  Coll. of Phys., Puerto Rico Region, 2031
  Coll. of Phys., Southeastern Region, 422
  Coll. of Phys., West Virginia Region, 296
  Coll. of Preventive Med., 911, 1668
  Coll. of Radiology, 2028, 2282
  Coll. of Surgs., 295, 703, 2031, 2281, 2282
  Coll. of Surgs., West Virginia Chapter, 297
  Cyanamid Company, Lederle Laboratories Div., 79
  Diabetes A., 793
  Diabetes A., Council of, 297
  Dietetic A., 793
  Electroencephalographic Soc., 78
  Federation for Clinical Research, 2279
  Found. for Tropical Med., 1241
  Fracture A., 77
  Friends Service Comm., 201
  Gastroenterological A., 299, 1560
  Goiter A., 1562
  Heart A., 298, 420, 912, 1242, 1382, 1557, 1788
  Hosp. A., 298, 1558
  Hungarian M. A., 1241
  Inst. of Electrical Engineers, 201
  Inst. of Physics, 1383
  Inst. of Ultrasonics in Med., 2282
  Laryngological A., 78
  M. A., 75, 201, 418, 702, 791, 909, 1141, 1143, 1144, 1558, 1667, 1669, 1910, 2029, 2032, 2033
  M. A., Comm. on M. Aspects of Automobile Injuries and Deaths, 76
  M. A., Council of Indust. Health, 197
  M. A., Council on Mental Health, 293
  M. A., House of Delegates, 1382
  M. Writers' A., 78, 1140, 1141, 1562, 1669
  M. Writers' A., Delaware Valley Chapter, 1561
  Medicine's "Festival of Faith", 417
  Medico-Psychological A., 2160
  Nat. Red Cross, 1144
  Neurological A., 1142
  Pediatric Soc., 201, 1911
  Physiological Soc., 1557
  [illegible]ner groups, [illegible] 2030

Am.—Continued

  Psychiatric A., 293, 418, 1239, 2033, 2160, 2278, 2282
  Psychiatric A., Comm. on Cooperation with Leisure Time Agencies, 298
  Public Health A., 794, 1239
  Recreation Soc., 298
  Rheumatism A., 1562
  Rhinologic Soc., 703
  Rocket Soc., Holloman Section, 1910
  Roentgen Ray Soc., 422, 1239, 1561
  Soc. of Anesthesiologists, 795
  Soc. for Artificial Internal Organs, 1557
  Soc. of Clinical Pathologists, 1143, 1145, 1558, 2157
  Soc. of Internal Med., Legislative Comm. of, 1911
  Soc. of Maxillofacial Surgs., 1245
  Soc. of Plastic and Reconstructive Surg., 423
  Soc. of Safety Engineers, 422
  Soc. for the Study of Arteriosclerosis, 912, 2159
  Soc. of Tropical Med. and Hygiene, 790, 1244
  Speech and Hearing A., 1563
  S. A., 295
  Therapeutic Soc., 200
  Trudeau Soc., 912, 1241

Arizona M. A., 1139

Arkansas Conf. of Tuberculosis Workers, 2155
  M. Soc., 417
  State Board of Health, 699

Armed Forces Inst. of Pathology, 2279

Army Ballistics Missile Agency, Development Operations Div., 199

Arthritis and Rheumatism Found., 79
  and Rheumatism Found., New England Chapter, 421

Associated Jewish Charities of Baltimore, 1140

A. for the Advancement of Psychoanalysis, 2030
  of Am. M. Colleges, 201, 294, 1560, 1789, 2029
  of Clinical Scientists, 205
  of M. Illustrators, 702
  of M. Record Consultants, 2033
  of M. Superintendents of Am. Institutions for the Insane, 2160
  of Military Surgs. of the United States, 1144, 2277
  of Surgs. of Great Britain and Ireland, 296
  for Research in Ophthalmology, Southern Section, 1143

Atlanta Tuberculosis A., 790

Atomic Energy Commn., 1563, 1666
  Energy Research Establishment of Harwell, England, 1668

Bahamas M. Conf., 1669
  S. Conf., 1790

Bailey, Mary, Found., 1789

Barker Welfare Found., 298

Beatty, Chester, Research Inst., 1245

Bennett, A. E., Neuropsychiatric Research Found., 200

Bergen County Tuberculosis and Health A. of New Jersey, 2030

Berks County M. Soc., 1562

Bexar County M. Soc., 1383

Biochemistry Research Inst., Buenos Aires, Argentina, 2033

Board of Psychiatry and Neurology, 1140

Bockus Internat. Soc. of Gastroenterology, 1560

Boston Psychoanalytic Soc. and Inst., 2157

British Inst. for the Study and Treatment of Delinquency, 1239
  Soc. of Gastroenterology, 296

Brooklyn Acad. of Arts and Sciences, 1382
  Acad. of Music, 1382
  Doctors' Symphony, 2158

Broome County M. Soc., 420

Cabell County M. Soc., 76

California Acad. of General Practice, 417
  Department of Public Health, 790, 1380
  Heart A., 2277
  Southern, Psychiatric Soc., 293

Canada, Board of Commissioners, 2282

Canadian Arthritis and Rheumatism Soc, 2281
  Cancer Soc., Saskatchewan Div., 1914
  M. A., 1141
  Soc. for the Study of Fertility, 913

Cancer Chemotherapy Nat. Service Center, 911, 1909

Cardiovascular Research Inst., 1380

Central Neuropsychiatric A., 795, 2281

Chicago A. of Commerce and Industry, 1381
  Gynecological Soc., 294
  Hearing Soc., 204
  Heart A., 1381
  Home for Incurables, 197
  Inst. of Med. of, 198, 908
  Inst. for Psychoanalysis, 198
  Laryngological and Otological Soc., 294
  M. Center District, 198
  Psychoanalytic Soc., 198
  Rehabilitation Inst., of, 198
  Soc. of Allergy, 1140
  Soc. of Internal Med., 1140
  Soc. of M. History of, 2029

Children's Cancer Research Found., Inc., 911

Chile, Nat. Health Service of, 2280

Chronic Disease Research Inst., 1559

Ciba Found., London, England, 77

Cleveland, Acad. of Med. of, 1141
  Clinic Found., 78, 1242, 2281
  Health Museum, 1141
  Soc. of Internal Med., Comm. on Insurance Plans, 1911

Clinical Orthopaedic Soc., 422, 2282

Coll. of Am. Pathologists, 1145, 2157

Colorado State Department of Public Health, 1557, 1665
  State M. Soc., 293, 1909

Commonwealth Fund of New York, 421, 1789

Communicable Disease Center, Atlanta, Ga., 1557, 1562, 1913

Conf. on Athletic Injuries, 77
  of Electrical Techniques in Med. and Biology, 201
  on Schizophrenia and the Family, 701
  on Tuberculosis, 1559

Congenital Child Amputee Conf. and Clinic, 700

Connecticut State M. Soc., 1380

Dearborn Chamber of Commerce, 2278
  Public Health Comm., 2278

Delaware County M. Soc., 1242

Denver Department of Health and Hospitals, 1557

Detroit, Health Federation, United Community Services of, 2278
  Mens Council Navy League of the U. S., 2278
  Rehabilitation Inst. of Metropolitan, 2157

Diabetes Week, 297

District of Columbia, M. Soc. of, 1380

Doctors' Orchestral Soc. of New York, 2158

Donner Found. of Philadelphia, 78, 1665

Easter Seal Research Found., 80

Eastern Panhandle M. Soc., 296
  Psychiatric Research A., 911

Education Found., Inc., 2031

Erie County M. Soc., 1141

Federal Bureau of Investigation, 1384, 2160
  Safety Conf., 422
  Safety Council, 422

Federation of Jewish Philanthropies, 2279

Fiske, Caleb, Fund, 77

Florida M. A., 1385
  State Board of Health, 699, 1385

Flying Phys. A., 1143

Food and Drug Administration, 1245

Ford Found., 2279

Friends M. Soc., 201

Gairdner Found., 2281

Gastroenterology Research Group, 1384

Georgetown University M. Alumni A., 1380

Georgia Warm Springs Found., 1667

Gerontological Research Found., 1145
  Soc., 1144

Grady Hosp. Clinical Soc., 418

Grant Found., 2160

Guild of Prescription Opticians of America, Inc., Ophthalmology Scholarship Fund, 298

Haiti, Republic of, Nat. Order of Merit and Honor, 1789

Hanna Fund, 2157

Hartford, John A., Found., 1243, 1787

Harvey Soc., 1560

Hawaii Cancer Soc., 1141

Health Insurance Council, New York City, 1911

Heart Fund, 298

Heart-in-Industry Conf., 1381

Heinz Research Center, 793

Hematology Research Found., 794

Hillsborough County M. A., 1385

Hosp. Research and Educational Trust, 1243

Household Finance Corporation, 1790

Houston Ophthalmological and Otolaryngological Soc., 2281

Idaho Soc. of Internal Med., 293

Illinois Acad. of General Practice, 1239
  Central, Soc. of Ophthalmology and Otolaryngology, 197
  Commn. for Handicapped Children, Advisory Comm. on Hearing Conservation and Rehabilitation of, 294
  Department of Public Welfare, 790, 1139
  Governor's Comm. on Employment of the Physically Handicapped, 1381
  Hosp. A., 298
  Psychiatric Soc., 1239
  Soc. of Anesthesiologists, 418, 1239
  State M. Soc., 1909, 2156
  State Psychiatric Inst., 1139
  Tuberculosis A., 293
  Indiana State M. A., 791

Inst. for Advancement of M. Communications, 78
  of Andean Biology in Morococha, 299
  for the Crippled and Disabled, 1560
  for Juvenile Research, 1139
  of Mental Health, 1142
  of Microbiology Polio Laboratory, 1562
  Nutrition of Central America and Panama, 793
  of Nutrition Sciences, 793
  of Orthopedics, Royal Nat. Orthopedic Hosp., in London, England, 2158
  Pasteur, Paris, France, 2033
  on Perinatal Casualties, 1910
  of Radio Engineers, 201

Instrument Soc. of America, 201

ties and Other Organizations—Continued
  nat. Children's Emergency Fund, 793
  Coll. of Surgs., 418, 1244, 1787
  Coll. of Surgs., Northeastern Section, 700
  Coll. of Surgs., U. S., Section, 912
  Coll. of Surgs., U. S. Section, Southeastern Region, 2032
  Cong. of Gastroenterologists, 1560
  Cong. of Microbiology, 201
  operation Administration of the U. S. State Department, 793, 1241, 1561
  Cooperation Administration, Health Div. for, 1559
  Labor Organization, 2282
  Soc. for Clinical and Experimental Hypnosis, 1145
  Symposium on Cardiovascular Diseases, 1564
  Symposium on the Status of Tuberculosis, 793
  Symposium on Tuberculosis, 1144
  terstate Postgraduate M. A., 1385
Iowa, State University of, Alumni A., 294
Irvington House Inst. for Rheumatic Fever and Allied Diseases, 2278
  House M. Advisory Comm., 2279
alian Soc. of Rheumatology, 1246
Italy, Republic of, Order of Merit, 418
Jefferson County Acad. of General Practice, 1910
  County M. Soc., 1911
  County Mental Health A., 1911
Jersey City M. Center Alumni A., 910
Jesuit Research Council of America, 1910
Johnson Found., 2279
Kaiser-Wilhelm Inst. for M. Research, Heidelberg, Germany, 1560
Kansas City, Health Div., 198
  Soc. of Pathologists, 1558
Kellogg, W. K., Found., 1240, 2280
  ny, Sister Elizabeth, Found., 1561, 2157
entucky Acad. of General Practice, 909
  State M. A., 198, 1381
Kessler Inst. for Rehabilitation, 700
King County M. Soc., 911
Kings County M. Soc., 1382
Kresge Found., 1382
Laird Found., 2031
Lake County Health Department, 2156
Lancaster County M. Soc., 1243
Langer, Ann, Cancer Research Found., 2280
Lead Hygiene Conf., 1244
  Industries A., 1244
Leukemia Soc., Inc., 1561
Liberian Inst., 1241
Life Insurance M. Research Found., 1142
Los Angeles County Heart A., 2277
  Obstetrical and Gynecological Soc., Inc., 908
  Radiological Soc., 908
Louisiana, Southwest, Graduate M. Assembly, 74
Lovelace Found., 1382, 1910, 2031
McGregor Fund., 1381
  chinery Dealers Nat. A., Philadelphia Chapter, 1789
Macy, Josiah, Jr., Found., 299
Maine Hosp. A., 1910
  M. A., 1910
  Tuberculosis A., 1909
March of Dimes, 1383
Maryland Acad. of General Practice, 699
Massachusetts M. Soc., 1142, 1910
May Inst. for M. Research, 1242
Mayo Found., 1559, 2157
  Found., Alumni A. of, 1788
M. Seminar for Lawyers, 296
Menninger Found., 78
Merck & Company, Inc., 75
Merrell, William S., Company, 75
Metropolitan Life Insurance Company, 77, 80, 299, 1665, 2159
Michigan Acad. of General Practice, 1140
  Allergy Soc., 1790
  Department of Health, 419, 911, 1558, 2030, 2156
  Heart A., 1381, 2278
  Soc. of Neurology and Psychiatry, 1910
  State M. Soc., 74, 1140, 1558
  United Fund, 2157
  Western, Pediatric Soc., 1240
Midwest Forum on Allergy, 1790
Military Medico-Dental Symposium on Space Med., 199
Milwaukee Acad. of Med., 1913
Ministry of Health, Standing M. Advisory Comm., 294
Minnesota Acad. of Science, 2157
  State Board of Health, 2157
  State M. A., 702, 2282
Mississippi Heart A., 1240
  Soc. of Anesthesiologists, 1240
  State Board of Health, 1240
  Valley Conf. on Tuberculosis, 795
  Valley M. Soc., 1788
  Valley Trudeau Soc., 795
Montana State M. A., 75, 791
Montreal, University of, Inst. of Experimental Med. and Surg., 75
Muscular Dystrophy A. of America, Inc., 1239
Nat. Acad. of Sciences-Nat. Research Council, 78, 197, 1245, 1560
  Acad. of Sciences-Nat. Research Council, Comm. on Radiology, 79
Nat.—Continued
  Advisory Arthritis and Metabolic Disease Council, 75
  Advisory Cancer Council, 1665
  Advisory Heart Council, 1559
  Advisory Neurological Diseases and Blindness Council, 1557
  Board of M. Examiners, Biochemistry Comm., 1557
  Cancer Inst., 911
  Cancer Inst. of Canada, 1914
  Comm. on Radiation Protection, 2028
  Council to Combat Blindness, Inc., 2032
  Found., 908, 1383, 2279
  Found., Comm. on Virus Research and Epidemiology, 790
  Found. for Infantile Paralysis, 908, 1383
  Found. for Research in Cutaneous Med., 1144
  Fund for M. Education, 200
  Health Council, 1142, 1668
  Heart Inst., 1239
  Inst. of Allergy and Infectious Diseases, U. S. Public Health Service, 420, 1140
  Inst. of Arthritis and Metabolic Diseases, 793
  Inst. of Mental Health, Mental Health Small Grant Comm., 1560
  Inst. of Mental Health, Training and Standards Branch, 1140
  Inst. of Neurological Diseases and Blindness, 1139
  Institutes of Health, 74, 197, 295, 421, 790, 792, 793, 909, 1141, 1384, 1557, 2028, 2277, 2279, 2280
  Institutes of Health, Metabolic and Arthritic Diseases Div., 701
  Institutes of Health, Nat. Advisory Council, 1911
  Library of Med., 2280
  M. A., Inc., 299, 418
  Neurological Research Found., 1143
  Office of Vital Statistics, 80, 199, 297, 423, 702, 1385, 1564, 1669, 1790, 1913, 2032
  Recreation A., 298
  Recreation Congress, 298
  Research Council, 418, 1245, 1381, 2279
  Research Council, Food and Nutrition Board, Comm. on Infant Nutrition, 2278
  Research Council to Canada, 1245
  Safety Cong. and Exposition, 422
  Safety Council, 1244, 2280
  Science Found., 1383, 1668
  Soc. for Crippled Children and Adults, 80, 1143
  Soc. for the Prevention of Blindness, 1789
  Statuary Hall, 1787
  Tuberculosis A., 293, 912, 1241
  Vitamin Found., 1242
NATO Advisory Group for Aeronautical Research and Development (AGARD), 1910
Navy Department, Aviation Med. Operations Bureau of Med. and Surg., 297
Nebraska Psychiatric Inst., 2278
Nestlé, French, Company, 78
Nevada State M. A., 198, 1910
New England Hosp. Assembly, 1910
  Postgraduate Assembly, 1142
  Soc. of Anesthesiologists, 200
  Soc. of Pathologists, Clinical Pathology Comm., 2278
New Hampshire M. Soc., 199, 1243
New Jersey Acad. of General Practice, 1243
  Diabetes A., 792
  Indust. Health Conf., 792
  Public Recreation A., 298
  Soc. of Pathologists, 1382
  Radiological Soc. of, 1241
  State Department of Health, 792, 1382
New Mexico Soc. of Internal Med., 700
New York Acad. of Med., 1382, 1789, 1911
  Allergy Soc., 1241
  Bureau of Indust. Health and Workmen's Compensation, 2278
  Bureau of M. Care Insurance, 2278
  Bureau of Public and Professional Relations, 2278
  Catholic Charities, Department of Health and *Hospitals*, 2159
  City Department of Health, 1382, 1666, 2158, 2159
  City Department of Health Bureau of Adult Hygiene, 2158
  City Health Research Council, 1667
  Department of Health, 1383
  Diabetes A., Clinical Soc. of, 420
  Inst. of Clinical Oral Pathology, 793, 1141
  M. Soc. of the State of, 419, 2278
  M. Soc. of the State of, Council Comm. on Public Health and Education, 419
  M. Soc. of the State of, Council Comm. on Workmen's Compensation, 1667
  M. Soc. of the State of, S. Section, 2281
  Neurological Inst., 793
  Northeastern, Radiological Soc., 1666
  Soc. for Clinical Ophthalmology, 1789
  State Air Pollution Control Board, 910
  State A. of Public Health Laboratories, 792, 1382
New York—Continued
  State Department of Civil Defense, 1383
  State Department of Health, 294, 419, 910, 1382, 1559
  State Department of Health, Div. of Local Health Services, 1668
  State Mental Health Research Unit, 197
  State M. Soc., 910, 1911
  Tuberculosis and Health A., 1559, 1789
Nobel Prize in Med., 2159
Northampton County M. Soc., 1243
North Carolina M. Soc., 75
North Central M. Conf., 701, 2282
North Dakota Acad. of General Practice, 1242
  University of, Alumni A., 75
Northwest Soc. for Clinical Research, 911
Nouvelle Faculte de Med. de Paris, 2280
Nuffield Found. in England, 421
Nutrition Found., Inc., 78, 793
Ochsner, Alton, M. Found., 78
Office of Vocational Rehabilitation, Washington, D. C., 419
Ohio, Central, Heart A., 205
  Soc. of Internal Med., 1911
Oklahoma City Clinical Soc., 910
  Colloquy on Advances in Med., 75
  Soc. of Anesthesiologists, 1242
Omaha Mid-West Clinical Soc., 791
  State Legislature, 1911
Onondaga County M. Soc., 1788
  State Board of Health, 1563
Oregon Acad. of General Practice, 700
  State Board of M. Examiners, 1560
  State M. Soc., 1141
  Trudeau Soc., 2159
  Tuberculosis and Health A., 2159
Pack M. Group, 2158
Pan Am. Sanitary Bureau, 1562, 1665, 1791, 2028, 2280
  Sanitary Conf., 2280
  Zoonoses Center, 1791
Pasteur Inst., 1559, 2282
Pennsylvania Acad. of Physical Med. and Rehabilitation, 2031
  Department of Health, 701
  M. Soc. of the State of, 420, 1242
Pfeiffer, Gustavus & Louise, Research Found., 298
Phi Delta Epsilon Fraternity, 1241, 1242
  Delta Epsilon Fraternity, Alpha Tau Chapter, 2156
  Delta Epsilon Fraternity, Beta Epsilon Chapter, 1242
  Delta Epsilon Fraternity, Beta Xi Chapter, 1382
  Delta Epsilon Fraternity, Upsilon Chapter, 1242
  Lambda Kappa M. Fraternity, 1140
Philadelphia, Coll. of Phys. of, 421
  Department of Public Health, 421
  Roentgen Ray Soc., 2279
Phipps Inst., 2279
Picker, James, Found., 79, 1245
Pittsburgh Department of Health, 2156
  Roentgen Soc., 1243
Planck, Max, Inst., 1559
  Max, Inst. for Cell Chemistry, Munich, Germany, 2033
Porter, Langley, Neuropsychiatric Inst., 293
Postgraduate Inst., 296
President Eisenhower's Comm. on Employment of the Physically Handicapped, M. Comm., 75, 1667
  Comm. on Employment of the Physically Handicapped, Employer's Subcommittee of, 2033
Prevost, Albert, Inst., Montreal, 2282
Puerto Rico M. A., 2031
Pulaski County M. Soc., 2277
Queens Pediatric Soc., 419
Radiological Soc. of North America, 422, 700, 1239, 2028
Receiving Hosp. Corporation, 1382
Reed, Walter, Army Inst. of Research, 1557
Republic Steel, 2157
Research Corporation, 2033
Rhode Island M. Soc., 77
Rockefeller Found., 75, 1791, 2279
  Found., Internat. Health Div. of, 1788
  Inst. for M. Research, 198, 1241, 2159
Roswell Park Memorial Inst., 1559
Royal Anthropological Inst. of Great Britain and Ireland, 419
  Army M. Corps., 2158
  Coll. of Surgs. of England, London, 1241, 1912
  Soc. of Med. of London, 2156
Sacramento County Board of Supervisors, 1665
Salt Lake County (Utah) Sheriff's Office, 1791
San Mateo, California, County Department of Health and Welfare, Mental Health Section of, 197
Saskatchewan Cancer and M. Research Inst., 1914
Scripps Clinic and Research Found., 1381
Seminar in Blood Banking and Immunohematology, 424
  on M. Education [illegible]
    Hospitals of

Societies and Other Organizations—Continued
Am.—Continued
  Acad. of General Practice, Montana Chapter, 1559
  Acad. of General Practice, Nevada Chapter, 1559
  Acad. of General Practice, North Dakota Chapter, 1242
  Acad. of General Practice, South Carolina Chapter, 1243
  Acad. of General Practice, South Dakota Chapter, 199
  Acad. of General Practice, Virginia Chapter, 296
  Acad. of General Practice, West Virginia Chapter, 297, 1912
  Acad. of Neurology, 1142
  Acad. of Opthalmology and Otolaryngology, 702, 1669
  Acad. of Orthopaedic Surgs., 2280
  Acad. of Pediatrics, 422, 911, 912, 1244, 2282
  Acad. of Physical Med. and Rehabilitation, 1244
  A. for the Advancement of Science, 1557
  A. for Blood Banks, 1561
  A. for the History of Med., 200
  A. of Hosp. Accountants, 298
  A. of M. Clinics, 1383
  A. of M. Record Librarians, 298
  A. of Poison Control Centers, 2159
  A. of Public Health Phys., 1142
  A. for the Study of Neoplastic Diseases, 1563
  A. for the Surg. of Trauma, 422, 2159
  A. of University Women, 1668
  Board of Anesthesiology, 1383
  Board of Internal Med., 201, 293, 417, 913
  Board of Pediatrics, 911
  Board of Psychiatry and Neurology, 1142, 1787
  Board of Radiology, 2279
  Board of Surg., 2031
  Cancer Soc., 198, 1140, 1243
  Cancer Soc., Florida Div. of, 1385
  Cancer Soc., Massachusetts Div., 1240
  Cancer Soc., Milwaukee Chapter, 1789
  Coll. of Allergists, 1139
  Coll. of Cardiology, 1385
  Coll. of Chest Phys., 200, 298, 1143, 1241, 1790
  Coll. of Gastroenterology, 1563
  Coll. of Hosp. Administrators, 298
  Coll. of Phys., 293, 419, 1381
  Coll. of Phys., Arizona Region, 790
  Coll. of Phys., Arkansas-Oklahoma Region, 795
  Coll. of Phys., Idaho-Utah Region, 293
  Coll. of Phys., Kentucky-Tennessee Region, 795
  Coll. of Phys., Midwest Region, 300
  Coll. of Phys., New England States, Quebec, and Atlantic Provinces, 1244
  Coll. of Phys., New Jersey, 1240
  Coll. of Phys., New Mexico, 700
  Coll. of Phys., Ohio Region, 1911
  Coll. of Phys., Puerto Rico Region, 2031
  Coll. of Phys., Southeastern Region, 422
  Coll. of Phys., West Virginia Region, 296
  Coll. of Preventive Med., 911, 1668
  Coll. of Radiology, 2028, 2282
  Coll. of Surgs., 295, 703, 2031, 2281, 2282
  Coll. of Surgs., West Virginia Chapter, 297
  Cyanamid Company, Lederle Laboratories Div., 79
  Diabetes A , 793
  Diabetes A., Council of, 297
  Dietetic A., 793
  Electroencephalographic Soc., 78
  Federation for Clinical Research, 2279
  Found. for Tropical Med., 1241
  Fracture A., 77
  Friends Service Comm., 201
  Gastroenterological A., 299, 1560
  Goiter A., 1562
  Heart A., 298, 420, 912, 1242, 1382, 1557, 1788
  Hosp. A., 298, 1558
  Hungarian M. A., 1241
  Inst. of Electrical Engineers, 201
  Inst. of Physics, 1383
  Inst. of Ultrasonics in Med., 2282
  Laryngological A., 78
  M. A., 75, 201, 418, 702, 791, 909, 1141, 1143, 1144, 1558, 1667, 1669, 1910, 2029, 2032, 2033
  M. A., Comm. on M. Aspects of Automobile Injuries and Deaths, 76
  M. A., Council of Indust. Health, 197
  M. A., Council on Mental Health, 293
  M. A., House of Delegates, 1382
  M. Writers' A., 78, 1140, 1141, 1562, 1669
  M. Writers' A., Delaware Valley Chapter, 1561
  Medicine's "Festival of Faith", 417
  Medico-Psychological A., 2160
  Nat. Red Cross, 1144
  Neurological A., 1142
  Pediatric Soc., 201, 1911
  Physiological Soc., 1557
  ner groups, [illegible] 2030

Am.—Continued
  Psychiatric A., 293, 418, 1239, 2033, 2160, 2278, 2282
  Psychiatric A., Comm. on Cooperation with Leisure Time Agencies, 298
  Public Health A., 794, 1239
  Recreation Soc., 298
  Rheumatism A., 1562
  Rhinologic Soc., 703
  Rocket Soc., Holloman Section, 1910
  Roentgen Ray Soc., 422, 1239, 1561
  Soc. of Anesthesiologists, 795
  Soc. for Artificial Internal Organs, 1557
  Soc. of Clinical Pathologists, 1143, 1145, 1558, 2157
  Soc. of Internal Med., Legislative Comm. of, 1911
  Soc. of Maxillofacial Surgs., 1245
  Soc. of Plastic and Reconstructive Surg., 423
  Soc. of Safety Engineers, 422
  Soc. for the Study of Arteriosclerosis, 912, 2159
  Soc. of Tropical Med. and Hygiene, 790, 1244
  Speech and Hearing A., 1563
  S. A., 295
  Therapeutic Soc., 200
  Trudeau Soc., 912, 1241
Arizona M. A., 1139
Arkansas Conf. of Tuberculosis Workers, 2155
  M. Soc., 417
  State Board of Health, 699
Armed Forces Inst. of Pathology, 2279
Army Ballistics Missile Agency, Development *Operations Div., 199*
Arthritis and Rheumatism Found., 79
  and Rheumatism Found., New England Chapter, 421
Associated Jewish Charities of Baltimore, 1140
A. for the Advancement of Psychoanalysis, 2030
  of Am. M. Colleges, 201, 294, 1560, 1789, 2029
  of Clinical Scientists, 205
  of M. Illustrators, 702
  of M. Record Consultants, 2033
  of M. Superintendents of Am. Institutions for the Insane, 2160
  of Military Surgs. of the United States, 1144, 2277
  of Surgs. of Great Britain and Ireland, 296
  for Research in Ophthalmology, Southern Section, 1143
Atlanta Tuberculosis A., 790
Atomic Energy Commn., 1563, 1666
  Energy Research Establishment of Harwell, England, 1668
Bahamas M. Conf., 1669
  S. Conf., 1790
Bailey, Mary, Found., 1789
Barker Welfare Found., 298
Beatty, Chester, Research Inst., 1245
Bennett, A. E., Neuropsychiatric Research Found., 200
Bergen County Tuberculosis and Health A. of New Jersey, 2030
Berks County M. Soc., 1562
Bexar County M. Soc., 1383
Biochemistry Research Inst., Buenos Aires, Argentina, 2033
Board of Psychiatry and Neurology, 1140
Bockus Internat. Soc. of Gastroenterology, 1560
Boston Psychoanalytic Soc. and Inst., 2157
British Inst. for the Study and Treatment of *Delinquency, 1239*
  Soc. of Gastroenterology, 296
Brooklyn Acad. of Arts and Sciences, 1382
  Acad. of Music, 1382
  Doctors' Symphony, 2158
Broome County M. Soc., 420
Cabell County M. Soc., 76
California Acad. of General Practice, 417
  Department of Public Health, 790, 1380
  Heart A., 2277
  Southern, Psychiatric Soc., 293
Canada, Board of Commissioners, 2282
Canadian Arthritis and Rheumatism Soc, 2281
  Cancer Soc., Saskatchewan Div., 1914
  M. A., 1141
  Soc. for the Study of Fertility, 913
Cancer Chemotherapy Nat. Service Center, 911, 1909
Cardiovascular Research Inst., 1380
Central Neuropsychiatric A., 795, 2281
Chicago A. of Commerce and Industry, 1381
  Gynecological Soc., 294
  Hearing Soc., 204
  Heart A., 1381
  Home for Incurables, 197
  Inst. of Med. of, 198, 908
  Inst. for Psychoanalysis, 198
  Laryngological and Otological Soc., 294
  M. Center District, 198
  Psychoanalytic Soc., 198
  Rehabilitation Inst., of, 198
  Soc. of Allergy, 1140
  Soc. of Internal Med., 1140
  Soc. of M. History of, 2029
Children's Cancer Research Found., Inc., 911
Chile, Nat. Health Service of, 2280
Chronic Disease Research Inst., 1559
Ciba Found., London, England, 77

Cleveland, Acad. of Med. of, 1141
  Clinic Found., 78, 1242, 2281
  Health Museum, 1141
  Soc. of Internal Med., Comm. on Insuranc Plans, 1911
Clinical Orthopaedic Soc., 422, 2282
Coll. of Am. Pathologists, 1145, 2157
Colorado State Department of Public Healt 1557, 1665
  State M. Soc., 293, 1909
Commonwealth Fund of New York, 421, 1789
Communicable Disease Center, Atlanta, Ga 1557, 1562, 1913
Conf. on Athletic Injuries, 77
  of Electrical Techniques in Med. and Biolog 201
  on Schizophrenia and the Family, 701
  on Tuberculosis, 1559
Congenital Child Amputee Conf. and Clini 700
Connecticut State M. Soc., 1380
Dearborn Chamber of Commerce, 2278
  Public Health Comm., 2278
Delaware County M. Soc., 1242
Denver Department of Health and Hospital 1557
Detroit, Health Federation, United Communit Services of, 2278
  Mens Council Navy League of the U. S., 227
  Rehabilitation Inst. of Metropolitan, 2157
Diabetes Week, 297
District of Columbia, M. Soc. of, 1380
Doctors' Orchestral Soc. of New York, 2158
Donner Found. of Philadelphia, 78, 1665
Easter Seal Research Found., 80
Eastern Panhandle M. Soc., 296
  Psychiatric Research A., 911
Education Found., Inc., 2031
Erie County M. Soc., 1141
Federal Bureau of Investigation, 1384, 2160
  Safety Conf., 422
  Safety Council, 422
Federation of Jewish Philanthropies, 2279
Fiske, Caleb, Fund, 77
Florida M. A., 1385
  State Board of Health, 699, 1385
Flying Phys. A., 1143
Food and Drug Administration, 1245
Ford Found., 2279
Friends M. Soc., 201
Gairdner Found., 2281
Gastroenterology Research Group, 1384
Georgetown University M. Alumni A., 1380
Georgia Warm Springs Found., 1667
Gerontological Research Found., 1145
  Soc., 1144
Grady Hosp. Clinical Soc., 418
Grant Found., 2160
Guild of Prescription Opticians of America Inc., Ophthalmology Scholarship Fund, 29
Haiti, Republic of, Nat. Order of Merit an Honor, 1789
Hanna Fund, 2157
Hartford, John A., Found., 1243, 1787
Harvey Soc., 1560
Hawaii Cancer Soc., 1141
Health Insurance Council, New York City, 191
Heart Fund, 298
Heart-in-Industry Conf., 1381
Heinz Research Center, 793
Hematology Research Found., 794
Hillsborough County M. A., 1385
Hosp. Research and Educational Trust, 1243
Household Finance Corporation, 1790
Houston Ophthalmological and Otolaryngological Soc., 2281
Idaho Soc. of Internal Med., 293
Illinois Acad. of General Practice, 1239
  Central, *Soc. of Ophthalmology and Otolaryngology*, 197
  Commn. for Handicapped Children, Advisory Comm. on Hearing Conservation and Rehabilitation of, 294
  Department of Public Welfare, 790, 1139
  Governor's Comm. on Employment of the *Physically Handicapped, 1381*
  Hosp. A., 298
  Psychiatric Soc., 1239
  Soc. of Anesthesiologists, 418, 1239
  State M. Soc., 1909, 2156
  State Psychiatric Inst., 1139
  Tuberculosis A., 293
  Indiana State M. A., 791
Inst. for Advancement of M. Communications, 78
  of Andean Biology in Morococha, 299
  for the Crippled and Disabled, 1560
  for Juvenile Research, 1139
  of Mental Health, 1142
  of Microbiology *Polio Laboratory*, 1562
  Nutrition of Central America and Panama, 793
  of Nutrition Sciences, 793
  of Orthopedics, Royal Nat. Orthopedic Hosp., in London, England, 2158
  Pasteur, Paris, France, 2033
  on Perinatal Casualties, 1910
  of Radio Engineers, 201
Instrument Soc. of America, 201

ties and Other Organizations—Continued
  nat. Children's Emergency Fund, 793
  Coll. of Surgs., 118, 1241, 1787
  Coll. of Surgs., Northeastern Section, 700
  Coll. of Surgs., U. S., Section, 912
  Coll. of Surgs., U. S. Section, Southeastern Region, 2032
  Cong. of Gastroenterologists, 1560
  Cong. of Microbiology, 201
  Cooperation Administration of the U. S. State Department, 793, 1241, 1561
  Cooperation Administration, Health Div. for, 1559
  Labor Organization, 2282
  Soc. for Clinical and Experimental Hypnosis, 1145
  Symposi[illegible] 1561
  Symposi[illegible] 793
  Symposi[illegible]
Interstate [illegible]
Iowa, Stat[illegible]
Irvington [illegible] and Allied Diseases, 2278
  House M. Advisory Comm., 2279
Italian Soc. of Rheumatology, 1246
Italy, Republic of, Order of Merit, 418
Jefferson County Acad. of General Practice, 1910
  County M. Soc., 1911
  County Mental Health A., 1911
Jersey City M. Center Alumni A., 910
Jesuit Research Council of America, 1910
Johnson Found., 2279
Kaiser-Wilhelm Inst. for M. Research, Heidelberg, Germany, 1560
Kansas City, Health Div., 198
  Soc. of Pathologists, 1558
Kellogg, W. K., Found., 1240, 2280
Kenny, Sister Elizabeth, Found., 1561, 2157
Kentucky Acad. of General Practice, 909
  State M. A., 198, 1381
Kessler Inst. for Rehabilitation, 700
King County M. Soc., 911
Kings County M. Soc., 1382
Kresge Found., 1382
Laird Found., 2031
Lake County Health Department, 2156
Lancaster County M. Soc., 1243
Langer, Ann, Cancer Research Found., 2280
Lead Hygiene Conf., 1244
  Industries A., 1244
Leukemia Soc., Inc., 1561
Liberian Inst., 1241
Life Insurance M. Research Found., 1142
Los Angeles County Heart A., 2277
  Obstetrical and Gynecological Soc., Inc., 908
  Radiological Soc., 908
Louisiana, Southwest, Graduate M. Assembly, 74
Lovelace Found., 1382, 1910, 2031
McGregor Fund., 1381
Machinery Dealers Nat. A., Philadelphia Chapter, 1789
Macy, Josiah, Jr., Found., 299
Maine Hosp. A., 1910
  M. A., 1910
  Tuberculosis A., 1909
March of Dimes, 1383
Maryland Acad. of General Practice, 699
Massachusetts M. Soc., 1142, 1910
May Inst. for M. Research, 1212
Mayo Found., 1559, 2157
  Found., Alumni A. of, 1788
M. Seminar for Lawyers, 296
Menninger Found., 78
Merck & Company, Inc., 75
Merrell, William S., Company, 75
Metropolitan Life Insurance Company, 77, 80, 299, 1665, 2159
Michigan Acad. of General Practice, 1140
  Allergy Soc., 1790
  Department of Health, 419, 911, 1558, 2030, 2156
  Heart A., 1381, 2278
  Soc. of Neurology and Psychiatry, 1910
  State M. Soc., 74, 1140, 1558
  United Fund, 2157
  Western, Pediatric Soc., 1240
Midwest Forum on Allergy, 1790
Military Medico-Dental Symposium on Space Med., 199
Milwaukee Acad. of Med., 1913
Ministry of Health, Standing M. Advisory Comm., 294
Minnesota Acad. of Science, 2157
  State Board of Health, 2157
  State M. A., 702, 2282
Mississippi Heart A., 1240
  Soc. of Anesthesiologists, 1240
  State Board of Health, 1240
  Valley Conf. on Tuberculosis, 795
  Valley M. Soc., 1788
  Valley Trudeau Soc., 795
Montana State M. A., 75, 791
Montreal, University of, Inst. of Experimental Med. and Surg., 75
Muscular Dystrophy A. of America, Inc., 1239
Nat. Acad. of Sciences-Nat. Research Council, 78, 197, 1245, 1560
  Acad. of Sciences-Nat. Research Council, Comm. on Radiology, 79
Nat.—Continued
  Advisory Arthritis and Metabolic Disease Council, 75
  Advisory Cancer Council, 1665
  Advisory Heart Council, 1559
  Advisory Neurological Diseases and Blindness Council, 1557
  Board of M. Examiners, Biochemistry Comm., 1557
  Cancer Inst., 911
  Cancer Inst. of Canada, 1914
  Comm. on Radiation Protection, 2028
  Council to Combat Blindness, Inc., 2032
  Found., 908, 1383, 2279
  Found., Comm. on Virus Research and Epidemiology, 790
  Found. for Infantile Paralysis, 908, 1383
  Found. for Research in Cutaneous Med., 1141
  Fund for M. Education, 200
  Health Council, 1142, 1668
  Heart Inst., 1239
  Inst. of Allergy and Infectious Diseases, U. S. Public Health Service, 420, 1140
  Inst. of Arthritis and Metabolic Diseases, 793
  Inst. of Mental Health, Mental Health Small Grant Comm., 1560
  Inst. of Mental Health, Training and Standards Branch, 1140
  Inst. of Neurological Diseases and Blindness, 1139
  Institutes of Health, 74, 197, 295, 421, 790, 792, 793, 909, 1141, 1384, 1557, 2028, 2277, 2279, 2280
  Institutes of Health, Metabolic and Arthritic Diseases Div., 701
  Institutes of Health, Nat. Advisory Council, 1911
  Library of Med., 2280
  M. A., Inc., 299, 418
  Neurological Research Found., 1143
  Office of Vital Statistics, 80, 199, 297, 423, 702, 1385, 1561, 1669, 1790, 1913, 2032
  Recreation A., 298
  Recreation Congress, 298
  Research Council, 418, 1245, 1381, 2279
  Research Council, Food and Nutrition Board, Comm. on Infant Nutrition, 2278
  Research Council to Canada, 1245
  Safety Cong. and Exposition, 422
  Safety Council, 1214, 2280
  Science Found., 1383, 1668
  Soc. for Crippled Children and Adults, 80, 1143
  Soc. for the Prevention of Blindness, 1789
  Statuary Hall, 1787
  Tuberculosis A., 293, 912, 1241
  Vitamin Found., 1242
NATO Advisory Group for Aeronautical Research and Development (AGARD), 1910
Navy Department, Aviation Med. Operations Bureau of Med. and Surg., 297
Nebraska Psychiatric Inst., 2278
Nestlé, French, Company, 78
Nevada State M. A., 198, 1910
New England Hosp. Assembly, 1910
  Postgraduate Assembly, 1142
  Soc. of Anesthesiologists, 200
  Soc. of Pathologists, Clinical Pathology Comm., 2278
New Hampshire M. Soc., 199, 1243
New Jersey Acad. of General Practice, 1243
  Diabetes A., 792
  Indust. Health Conf., 792
  Public Recreation A., 298
  Soc. of Pathologists, 1382
  Radiological Soc. of, 1241
  State Department of Health, 792, 1382
New Mexico Soc. of Internal Med., 700
New York Acad. of Med., 1382, 1789, 1911
  Allergy Soc., 1241
  Bureau of Indust. Health and Workmen's Compensation, 2278
  Bureau of M. Care Insurance, 2278
  Bureau of Public and Professional Relations, 2278
  Catholic Charities, Department of Health and Hospitals, 2159
  City Department of Health, 1382, 1666, 2158, 2159
  City Department of Health Bureau of Adult Hygiene, 2158
  City Health Research Council, 1667
  Department of Health, 1383
  Diabetes A., Clinical Soc. of, 420
  Inst. of Clinical Oral Pathology, 793, 1141
  M. Soc. of the State of, 419, 2278
  M. Soc. of the State of, Council Comm. on Public Health and Education, 419
  M. Soc. of the State of, Council Comm. on Workmen's Compensation, 1667
  M. Soc. of the State of, S. Section, 2281
  Neurological Inst., 793
  Northeastern, Radiological Soc., 1666
  Soc. for Clinical Ophthalmology, 1789
  State Air Pollution Control Board, 910
  State A. of Public Health Laboratories, 792, 1382
New York—Continued
  State Department of Civil Defense, 1383
  State Department of Health, 294, 419, 910, 1382, 1559
  State Department of Health, Div. of Local Health Services, 1668
  State Mental Health Research Unit, 197
  State M. Soc., 910, 1911
  Tuberculosis and Health A., 1559, 1789
Nobel Prize in Med., 2159
Northampton County M. Soc., 1243
North Carolina M. Soc., 75
North Central M. Conf., 701, 2282
North Dakota Acad. of General Practice, 1242
  University of, Alumni A., 75
Northwest Soc. for Clinical Research, 911
Nouvelle Faculte de Med. de Paris, 2280
Nuffield Found. in England, 421
Nutrition Found., Inc., 78, 793
Ochsner, Alton, M. Found., 78
Office of Vocational Rehabilitation, Washington, D. C., 419
Ohio, Central, Heart A., 205
  Soc. of Internal Med., 1911
Oklahoma City Clinical Soc., 910
  Colloquy on Advances in Med., 75
  Soc. of Anesthesiologists, 1212
Omaha Mid-West Clinical Soc., 791
  State Legislature, 1911
Onondaga County M. Soc., 1788
  State Board of Health, 1563
Oregon Acad. of General Practice, 700
  State Board of M. Examiners, 1560
  State M. Soc., 1141
  Trudeau Soc., 2159
  Tuberculosis and Health A., 2159
Pack M. Group, 2158
Pan Am. Sanitary Bureau, 1562, 1665, 1791, 2028, 2280
  Sanitary Conf., 2280
  Zoonoses Center, 1791
Pasteur Inst., 1559, 2282
Pennsylvania Acad. of Physical Med. and Rehabilitation, 2031
  Department of Health, 701
  M. Soc. of the State of, 420, 1242
Pfeiffer, Gustavus & Louise, Research Found., 298
Phi Delta Epsilon Fraternity, 1241, 1242
  Delta Epsilon Fraternity, Alpha Tau Chapter, 2156
  Delta Epsilon Fraternity, Beta Epsilon Chapter, 1242
  Delta Epsilon Fraternity, Beta Xi Chapter, 1382
  Delta Epsilon Fraternity, Upsilon Chapter, 1242
  Lambda Kappa M. Fraternity, 1140
Philadelphia, Coll. of Phys. of, 421
  Department of Public Health, 421
  Roentgen Ray Soc., 2279
Phipps Inst., 2279
Picker, James, Found., 79, 1245
Pittsburgh Department of Health, 2156
  Roentgen Soc., 1243
Planck, Max, Inst., 1559
  Max, Inst. for Cell Chemistry, Munich, Germany, 2033
Porter, Langley, Neuropsychiatric Inst., 293
Postgraduate Inst., 296
President Eisenhower's Comm. on Employment of the Physically Handicapped, M. Comm., 75, 1667
  Co[illegible] of the Physically [illegible] Subcommittee of, [illegible]
Prevost, Albert, Inst., Montreal, 2282
Puerto Rico M. A., 2031
Pulaski County M. Soc., 2277
Queens Pediatric Soc., 419
Radiological Soc. of North America, 422, 700, 1239, 2028
Receiving Hosp. Corporation, 1382
Reed, Walter, Army Inst. of Research, 1557
Republic Steel, 2157
Research Corporation, 2033
Rhode Island M. Soc., 77
Rockefeller Found., 75, 1791, 2279
  Found., Internat. Health Div. of, 1788
  Inst. for M. Research, 198, 1241, 2159
Roswell Park Memorial Inst., 1559
Royal Anthropological Inst. of Great Britain and Ireland, 419
  Army M. Corps., 2158
  Coll. of Surgs. of England, London, 1241, 1912
  Soc. of Med. of London, 2156
Sacramento County Board of Supervisors, 1665
Salt Lake County (Utah) Sheriff's Office, 1791
San Mateo, California, County Department of Health and Welfare, Mental Health Section of, 197
Saskatchewan Cancer and M. Research Inst., 1914
Scripps Clinic and Research Found., 1381
Seminar in Blood Banking and Immun[illegible]matology, 424
  on M. Education [illegible]
    Hospitals of [illegible]

Societies and Other Organizations—Continued
Sheard-Sanford Fund., 1143
Sheckman, Mona Bronfman, Found., 2029
Societe Internationale de Chirurgie, 2158
Soc. of Biological Chemists, 1560
  of Biological Psychiatry, 200
  for Clinical and Experimental Hypnosis, 1145
  of Experimental Test Pilots, 2028
  for Investigative Dermatology, 418
  for Scientific Study of Sex, 1241
South Dakota State Board of M. and Osteopathic Examiners, 793
Southeastern Allergy A., 1139
  States Cancer Seminar, 1385
Southern Gynecological and Obstetrical Soc., 1143
  M. A., 1143, 1668
  M. A. Woman's Auxiliary, 1668
  Regional Council on Mental Health Training and Research, 1243
  Regional Education Board, 1384, 1557
  Research Inst., 1665
Southwestern Dermatological Soc., 1146
  M. A., 1145
Spanish Psychological Soc., 1239
Sports Illustrated's Silver Anniversary All-America, 2281
Squibb Centennial Lecture Comm., 1381
Stanford Research Inst., 1909
Sterling-Winthrop Inst., 1245
S. Research Soc., 296
Symposium in Aviation Med., 2028
  on Cinefluorography, 700
  on Hypertension, 1911
  on Infectious Diseases, 74
  on M. Mobilization for Disaster, 1383
Tennessee Radiological Soc., 1667
Texas Acad. of General Practice, 76
  Commn. on Higher Education for the State of, 1243
  State Hospitals and Special Schools, Board for, 1243
Unitarian Service Comm., 2030
United Cerebral Palsy, 1562
  Cerebral Palsy Associations, Inc., 420
  Cerebral Palsy Research and Educational Found., Inc., 420
  Found., 2157
  Fruit Company, 1788
  Nations' Food and Agricultural Organization, 793
USAF Scientific Advisory Board, Aeromedical *Panel of*, 1910
U. S. Children's Bureau, 1239
  Department of Defense, 2279
  Department of Health, Education and Welfare, 74, 1558
  Department of Health, Education, and Welfare, Children's Bureau of, 1913
  Department of Health, Education and Welfare, Office of Vocational Rehabilitation, 1239
  Department of the Interior, Div. of Health, Bureau of Mines, 2282
  Department of the Navy, Div. of Preventive Med., Bureau of Med. and Surg., 1563
  Food and Drug Administration, 1382, 1557
  Navy M. Corps., 1909
  Office of Naval Research, 2279
  Office of Vocational Rehabilitation, 1140
  Public Health Service, 197, 199, 417, 699, 790, 793, 911, 1140, 1144, 1241, 1245, 1380, 1381, 1557, 1559, 1560, 1563, 1665, 1912, 2028, 2157, 2279, 2280
  Public Health Service, Aberdeen Area, Div. of Indian Health, 2157
  Public Health Service, Surgeon General's Accident Prevention Advisory Comm., 76
  Typhus Commn., 790
Utah State Legislature, 1912
  State M. A., 1383
Variety Club of Washington, D. C., 2277
Vermont State M. Soc., 199, 1243
Veterans Administration, 293
Virginia Acad. of General Practice, 1561
  M. Soc. of, 794
VOKS (Union of Soviet Societies for Cultural Relations with Foreign Countries), 201
Washington Acad. of Science, 790
  D. C. Dermatological Soc., 1239
  George, University M. Soc., 1380
  State Department of Health, 794
  State Heart A., 794
  State M. A., 76, 1244
Waterhouse, Benjamin, M. History Soc., 909, 1381, 2156
Wayne County Acad. of General Practice, 1140
  County M. Soc., 1140
  County M. Soc., Public Relations Comm. of, 2278
  County, West, Steering Comm. of Child Guidance Project, 2278
Wellcome Found., 793
Western Indust. M. A., Inc., 2160
  S. A., 1562

West Virginia—Continued
  State Board of Examiners for Practical Nurses, 296
  State Department of Mental Health, Div. of Community Services of, 2031
  State M. A., 296, 911
  Tuberculosis and Health A., 1142
Whitney, Helen Hay, Found., 1669
Wisconsin Acad. of General Practice, 77
  Anti-Tuberculosis A., 794
  Heart A., 77
  Orthopedic Soc., 77
  Soc. of Pathologists, 1789
  State High School Coaches' A., 77
  State M. Society's Charitable, Educational and Scientific Found., 77
Wistar Inst., 1383
World Health Organization, 201, 1386, 1665, 2028, 2030, 2280
  Rehabilitation Fund, 2033

T

THQ: See Tetrahydroxyquinone
TSH: See Thyrotropin
TACHYCARDIA
  paroxysmal, hiatus hernia cause? 1423
TANTALUM
  182 for bladder tumors, [Jönsson] 961—ab
TAPES, nylon, self-adhering, [Gershman] 930—C
TASK FORCE
  material in emergency medical care study, evaluate, [Medicine at Work] 773
TASTE
  bitter, with fairly large hiatus hernia, cause, treatment, 136
TATUM, EDWARD LAWRIE, Nobel prize to, 1915; 2159
TAX
  deduction for tuition costs of higher education, A. M. A. resolution on, 69
  deduction of professional entertainment expenses, [Medicine and the Law] 1555
  Income, deferment on retirement funds: See Jenkins-Keogh Bills
TEBAMIN: See Aminosalicylic Acid, phenyl ester
TECHNOLOGISTS
  medical, schools for, 1544
TEENAGERS: See Adolescence
TEETH
  caries-producing potential of chocolate, [Mueller] 436—C
  caries, statistics, Japan, 1394
  changes as signs of radium poisoning, [Dalitsch; Clark] 1929—C
  degeneration, estrogens and androgens for? 2333
  extraction during anticoagulant therapy, 2081
  ill-fitting dentures, intermittent parotid swelling due to, [Furstenberg] 1579—ab
  intake of milk relation to formation of, and prevention of caries, 844
  oral diagnosis of systemic disease, [Hopp] *748
  Syrian hamster, transplantation and replantation experiments using, [Myers] 1288—ab
TEFLON
  crimped, peripheral arterial grafts of, [Edwards] 452—ab
TELEVISION
  A. M. A. activities, annual reports, 1050; 1074; 1075; 1077
  public relations using, Rochester, N. Y. Health Forum, [Townsend & Steinhausen] *1983
  sensationalism in medicine, United Kingdom, 809
  viewing, movable footrest for elevation of lower extremity, [Fox] *1647
TEMARIL: See Trimeprazine
TEMPERATURE, BODY
  cold babies, United Kingdom, 97
TEMPOROMANDIBULAR JOINT: See Jaws
TEMPOSIL: See Carbimide, citrated calcium
TENDONS
  inflammation, calcareous and noncalcareous, about trochanter major, [Leonard] *175
  sheaths, tuberculosis activated by hydrocortisate, [Jørgensen] 713—ab
TERMINOLOGY
  "flat film" of abdomen, what does it mean? (reply) [Lamm] 1154—C
  of operating room mortality, A. M. A. resolution on, 67
  Standard Nomenclature of Diseases and Operations, annual report, 1041
  what is the cause of death? [Erhardt] *161; (reply) [Ziegler] 1260—C
TERRAMYCIN: See Oxytetracycline
TESTES
  Hormone: See Androgens
  pain during coitus, 15 years after crushing injury, treatment, 1956
  undescended, management of, [Brunet] 962—ab
TESTIMONY: See also Witness
  medical, impartial, 50—E

TESTOSTERONE: See Androgens
TETANUS
  antitoxin, administering under general thesia prevent anaphylaxis? 1958
  antitoxin, Denmark, 1923
  chronic leg ulcers and, [Riis] 1700—ab
  death from, reported, N. J., 75
  especially in newborn, Denmark, 706
  neonatorum, Brazil, 2167
  prophylaxis, penicillin, 1169
  toxoid, booster dose in relation to tim injury, 842
  toxoid, Canada, 1678
  treatment, gallamine triethiodide, India,
  treatment, India, 1925
  treatment, recent evaluation, [Miller & St ing] *393
TETANY
  neonatal, clinical signs; occurrence in b of diabetic mothers, [Craig] 1717—ab
TETRACAINE
  absorption of local anesthetic, [Campbe Adriani] *873
  as spinal anesthetic, pharmacology, [Fea stone] *1327
TETRACYCLINE
  toxicity, hazards, [Herrell] *1875
  treatment (intraperitoneal) in diffuse terial peritonitis in childhood, [S 965—ab
  treatment plus chloramphenicol in brucel [Parravicini] 125—ab
TETRACYN: See Tetracycline
TETRAETHYLTHIURAMDISULFIDE: See ulfiram
TETRAHYDROXYQUINONE
  treatment of keloids, [Kelly] 2073—ab
THALASSEMIA MINOR: See Leptocytosis
THERAPEUTICS
  special problems, A. M. A. report, 1056
THIOPENTAL SODIUM
  old surplus, use of, 1594
"THIRD PARTY": See under Medicine
THORAX
  anomalies, funnel chest, 1550—E
  chest x-rays at Naval Station in tropics, on histoplasmosis, [Scalia] 224—ab
  chest x-rays for school personnel, 2080
  chest x-rays, mobile unit in carui disease detection, [Feig] 841—ab
  deformities from sleeping on stomach?
  pain of colon origin, [Palmer] 1702—ab
  surgery, balanced analgesia for poor-risk tient, [Santos & Sweet] *1977
  surgery, for pulmonary tuberculosis, of, [Frew] 951—ab
  surgery, hypothermia in poor risk [Brewer] 1588—ab
  surgery team tours South America, Sw 1800
THORAZINE: See Chlorpromazine
THROMBOANGIITIS OBLITERANS
  treatment: malarial therapy, [Corelli] 17 ab
THROMBOCYTOPENIA: See Purpura
THROMBOEMBOLISM: See Thrombosis
THROMBOENDARTERECTOMY
  for obliterative arteriosclerosis, Norway,
THROMBOPATHY: See Blood platelets
THROMBOPHLEBITIS
  cerebral, postpuerperal, France, 803
  complicating staphylococcic endocarditis ed with ristocetin, [Weber] *1346
THROMBOPLASTIN: See under Blood
THROMBOSIS
  acute venous thromboembolism, manage [Anlyan & others] *725
  aortic, [Starer] 214—ab
  arterial, after promazine hydrochloride, sky & others] *1224
  carotid artery, internal, (simulating cranial space-occupying lesion) [C 117—ab; (complications in surgery [Lemmen] 450—ab
  cerebral, anticoagulants to prevent after attack in man 65? 1593
  coronary, long-term anticoagulants in, Kingdom, 924
  intracranial venous, in puerperium, [Ore] 956—ab
  lung thromboembolism, frequency of, mark, 1924
  mesenteric vascular, [Robertson] 217—al
  postoperative venous, in lung surgery, [M 330—ab
  prevention, movable footrest for elevatio lower extremity, [Fox] *1647
  treatment: fibrinolysin, [Sokal & *1314
THRUSH: See Monilia; Moniliasis
THYMOMA
  benign, aregenerative anemia with, [son] 1403—ab
THYMUS
  cystic, myasthenia gravis after removal, trolytes during crisis, [Fongi] 456—ab
  factor in predisposes mice to radiation-duced leukemia, United Kingdom, 312

D
er, after irradiation, United Kingdom,
, metastatic, treatment, 1953
, cause progressive myopia? 1837
rch, Van Meter prize to Dr. Duncan D.
Adams for, New Zealand, 1570
ting hormone in blood, New Zealand,
926
ROPIN (TSH; Thyrotropic Hormone)
blood, New Zealand, 1926
DOULOUREUX: See Neuralgia, trigeminal
d, removal, 2206
G in hay fever therapy, factor in evalu-
n of drugs, (reply) [Engelsher] 1685—C
: See Isoniazid
ES
of Leishmania donovani, Canada, 2201
free, in female mammary gland, occur-
and significance, [Ratzenhofer]
6—ab
committee, uses and abuses of, [Hen-
& others] *2243
CCO
opia and vitamin B_{12}, United Kingdom,
smoking campaign, (United Kingdom)
; (Norway) 1151
with atypical epithelial changes in
e exposed to cigarette smoke, [Leuchten-
ger] 223—ab
gens in, 363
and cancer, research on, United
om 212
ing and lung cancer, public's views on,
Kingdom, 1573
ine and vitamins metabolism, 2334
genotypes, United Kingdom, 212
in etiology of headaches, 1954
: See Vitamins E
LINE HYDROCHLORIDE
lung lesions and cancer of esophagus,
2040
DE: See Sulfonylureas
, United Kingdom, 315
, 100 cases, [Argonz] 947—ab
diagnosis of systemic disease, [Hopp] *748
treatment, 1423
in, in multiple sclerosis, treatment, 843
-FANCONI SYNDROME
in, clinical and metabolic study of
cases in family, [Worthen] 121—ab
S
antibiotics for, United Kingdom, 2049
S
recurrent, medical treatment, 1957
ES
management of mass casualties,
yttle] 1826—ab
liability of charitable hospitals to pati-
[Medicine and the Law] 788
LLIS
of one side of head, in infant 11
old, treatment, 135
, not helped by chemopallidectomy,
& Dow] *755
s (cryptococcosis)
of lungs, central nervous system
probably veins, [Pelaez] 321—ab
tis, Amphotericin B for, [Rubin] 1271
b
[Jacobs] 1949—ab
UET
band, for hemostatis in preserving
function during partial nephrectomy,
odwin & Thelen] *179
GY: See Poisoning; under names of
substances
LASMOSIS
diagnostic importance of choriore-
, [Fair] *250
in mouse, spiramycin for, [Gar-
835—ab
, United Kingdom, 924
, [Hogan] 2322—ab
of Toxoplasma from human eye,
2321—ab
in Toronto area, Canada, 430
of Toxoplasma gondii in blood "in
" [Talice] 350—ab
Kingdom, 927
ations of endotracheal intubation,
& others] *1959
acheal intubation, minor laryngeal
lae of, [Wolfson] 1417—ab
indications and contraindica-
ns, [Mayer & others] *169
tracheobronchial lymph-node in-
in maturity, [le Melletier] 110—ab
OMY
ute intermittent porphyria with respira-
paralysis, [Doll & others] *1973
tive respiratory insufficiency,
1407—ab
MA
attempted isolation of, [Smith] 2074—

TRACTION
  complications and problems of, in supracondylar fractures of humerus in children, [Staples] *730
TRACTOR noise, effect on auditory sensitivity of operators, [Lierle] 1721—ab
TRADE: See under Industrial
TRAFFIC ACCIDENTS: See Automobiles
TRANQUILIZING DRUGS: See also specific drugs as Rauwolfia serpentina
  allergic reactions to, [Hollister] 964—ab
  intoxication, accidental, control of, [Cann & others] *717
TRANSAMINASE (aminopherase)
  activity as index of effectiveness of cortisone in chronic hepatitis, [O'Brien] 443—ab
  diagnostic value in hepatic and gastrointestinal diseases, [Pryse-Davies] 443—ab
  glutamic oxalacetic, in acute and chronic alcoholism, [Bang & others] *156
  glutamic oxalacetic, test in myocardial infarction, calorimetric method, [Ciocia] 213—ab
  in neonatal period, aid in differential diagnosis of jaundice, [Kove & others] *860
  SGO test in myocardial infarction, [Chapin] 939—ab
TRANSILLUMINATION
  of infant head demonstrated by hydranencephaly, [Griffiths] 1713—ab
TRAUMA
  aortic-right ventricular fistula after, surgical repair, [King] 114—ab
  Athletic: See Athletics
  Automobile Accidents: See Automobiles
  Burns: See Burns
  carbohydrate metabolism and, India, 1799
  care of patient with multiple injuries, [Aufranc] *2091
  cone shell stings, [Kohn] 1702—ab
  contrecoup brain damage with headache, nose discharge and bilateral nerve deafness; cause, treatment, 2081
  extradural hemorrhage after, control of, New Zealand, 95
  Fractures: See Fractures
  head injury in etiology of muscular dystrophy, 1422
  hematuria in boxers, [Kleiman] *1633
  in pathogenesis of primary rheumatism, [Schiavetti] 1576—ab
  Industrial: See Industrial Accidents
  loss of smell after head injury, 1423
  "Man Who Didn't Walk," medicolegal film, [Medicine and the Law] 72
  management of severely injured patient, genitourinary aspects, [Schulte] *2094
  neurosurgical care of severely injured patient, [Odom] *2087
  nonpenetrating injury of aorta, [Parmley] 113—ab
  nonpenetrating injury of heart, [Parmley] 1823—ab
  operative, to renal artery, nephrogenic hypertension after, [McDonald] 451—ab
  persistent post-traumatic fluid fistulas, [Calvet] 1705—ab
  personal injury, expert witness and advisory panels, [Sadusk] *2121
  principles in surgical management of mass casualties, [Ziperman] 453—ab
  relation to cause or aggravation of osteosarcoma or Ewing's sarcoma? 135
  repair injury to common bile duct, [Hoffman] 1268—ab
  revision of manual on evaluation of injuries, A. M. A. resolution on, 899
  ruptured diaphragm, problem of, [Bernatz & others] *877
  severe head injuries, treatment, [Maciver] 2062—ab
  testicular pain during coitus 15 years after crushing injury, treatment, 1956
  tetanus toxoid booster in relation to time of injury, 842
  traumatic aneurysm of thoracic aorta, roentgen diagnosis, [Steinberg] 973—ab
  traumatic shock, physiopathology, [Laborit] 840—ab
  urticarial response to, cause, treatment, 1837
TRAVEL
  international, immunization information on, 914
TREPONEMA
  antigens, France, 1255
  pallidum immobilization test, biological false-positive serologic tests for syphilis in low socioeconomic group, [Waring & others] *2004
TRIACETYLOLEANDOMYCIN
  antibacterial activity of serum after, [Kunin] 2071—ab
  N. N. D., 1012
TRIAMCINOLONE
  clinical trials, United Kingdom, 1258
  toxicity: peptic ulcer, [Brown] 2072—ab
  treatment; clinical, laboratory and experimental findings, [Scalabrino] 1948—ab
  treatment of systemic lupus erythematosus, [Dubois] 1948—ab

TRICUSPID VALVE
  stenosis, clinical features, [Killip] 321—ab
TRIFLUPROMAZINE HYDROCHLORIDE
  N. N. D., 1772
TRILAFON: See Perphenazine
TRIMEPRAZINE
  new oral antipruritic, [Williams] 2318—ab
TRIMETHYLENE: See Cyclopropane
TROCHANTERIC SYNDROME
  calcareous and noncalcareous tendonitis and bursitis about trochanter major, [Leonard] *175
TROPHOBLASTIC Tumors: See Tumors
TROPICAL DISEASE, Caribbean, study of, Florida, 2277
TROPICAL EOSINOPHILIA: See Eosinophilia
TROPICAL MEDICINE
  survey of research in, 2279
TROPICS
  mass chest survey at Naval station in, notes on histoplasmosis, [Scalia] 224—ab
[illegible]
T
  in treatment of tuberculous lymphadenitis and tuberculous fistulae, [Rapoport] 1581—ab
TRYPTAR: See Trypsin
TUBE
  complications of endotracheal intubation, [Hamelberg & others] *1959
  endotracheal intubation, minor laryngeal sequelae of, [Wolfson] 1417—ab
TUBERCLE BACILLUS
  examine menstrual blood for in tuberculosis sanatorium, [Pickroth] 2070—ab
  guinea pig vs. culture tests for, Sweden, 1394
  sensitivity to streptomycin and isoniazid of mycobacteria isolated from untreated primary tuberculosis, [Spina] 1945—ab
TUBERCULIN
  P. P. D. test, wheal at site of associated with asthmatic attack, 1424
  test in physical examinations for school children, (replies) [Faber; and original consultant] 984
  test, multiple-puncture technique: "Heaf test," 716
  test, new horizons for, 894—E
TUBERCULOMA
  criteria for roentgen differential diagnosis, [Oliva] 1725—ab
TUBERCULOSIS
  antibodies in Boeck's sarcoid, [Müller] 1288—ab
  BCG vaccination, community trials, [Palmer] 355—ab
  BCG vaccination of premature infants, [Eckardt] 122—ab
  BCG vaccination, otitis in nurslings after, [Soboleva] 464—ab
  BCG vaccination, Sweden, 708
  BCG vaccine, suppurative lymphadenitis due to, [Mande] 324—ab
  BCG vaccine to prevent leprosy, Brazil, 1677
  control, 30-year appraisal of BCG vaccination in. [Aronson] 132—ab
  death rates, Netherlands, 2045
  deaths from, increase, N. Y., 1559
  effects of chickenpox on, Brazil, 430
  experimental, immunity in, [Acharya] 1587—ab
  handling tuberculous specimen, 134
  international symposium on, 1144
  Japan, 2170
  leukocyte sedimentation rate in, [Lusvarghi] 2200—ab
  miliary, influence of adrenal cortical hormones on course of, [Nitschke] 2193—ab
  peptic ulcer and, higher than average, significant occurrence, United Kingdom, 313
  n immunology of
  711—ab
  school epidemics, [Mande] 1715—ab
  statistics on, India, 1258
  survey, India, 1925
  treatment: isoniazid, early results in relation to active level in serum, [Vivien] 325—ab
  treatment: isoniazid, pyridoxine to prevent toxicity, [Ross] *273; (reply) [Middlebrook] 1685—C
  treatment: prednisone in, (India) 1681; (Portugal) 2170
  treatment: pyrazinamide and cycloserine, [Zorini] 834—ab
  treatment: streptovaricin in guinea pig, [Stern] 837—ab
  treatment: Tebamin, [Tørning] 1294—ab
  tuberculous empyema, topical pyrazinamide for, [Costa] 2324—ab
  tuberculous fistula of esophagus, surgery successful in, [Pecora] 446—ab
  tuberculo[illegible] and lymphadenitis, tryps
  in f[illegible] 1581—ab
  [illegible]itis, treatment, [Ryds-
  [illegible] D. S. vacc

TUBERCULOSIS OF LUNG
  absence of pulmonary hypertrophic osteoarthropathy in, [Skorneck] 108—ab
  advanced, cortisone as cover for major surgery in, [Edge] 2185—ab
  artificial pneumoperitoneum in, India, 434
  cavitation in, Brazil, 88
  epidemic in mixed day school, United Kingdom, 810
  gastric resection and, [Neubert] 2306—ab
  of doubtful activity, chemotherapy in, United Kingdom, 212
  parenchymal, endoscopic treatment, [Carabelli] 1158—ab
  pathology and bacteriology of resected lesions after chemotherapy, [Cotter] 713—ab
  peptic ulcer and, [Waingortin] 823—ab
  postprimary, frequency, according to pulmonary arterial pressure, [Mattson] 2298—ab
  primary, untreated, sensitivity to streptomycin and isoniazid of mycobacteria isolated from, [Spina] 1945—ab
  reactivation (local) of primary focus, [Snijder] 2299—ab
  risk of, in pulmonary infiltration and fibrosis, [Chase] 2059—ab
  sanatorium, examine menstrual blood for tubercle bacilli in, [Pickroth] 2070—ab
  serofibrinous pleurisy in, incidence of morbidity and disorders secondary to, before and after antibiotic era, [Batini] 2317—ab
  silica exposure after, 2330
  surgical treatment in mentally ill, [Mowlem] 330—ab
  surgical treatment, pregnancy after pneumonectomy, 74 cases, [Laros] 2312—ab
  surgical treatment: thoracic surgery, results of, [Frew] 951—ab
  treatment, conservative, open healing of cavities after, [Wilson] 1285—ab
  treatment: Hinconstarch, [Barry] 837—ab
  treatment, temporary collapse in, [Rogue] 2300—ab
  treatment: Verazide, [Rubbo] 1286—ab
TULAREMIA
  Sweden, 807
TUMORS
  benign with malignant, significant difference in incidence? 1958
  bladder, tantalum 182 for, [Jönsson] 961—ab
  bone, what cytology offers in diagnosis, [Sicard] 127—ab
  cells in peripheral blood, failure to prove identity of, [Taylor] 2198—ab
  Chromaffin Cell: See Pheochromocytoma
  diagnosis (early), especially carcinoma of uterus, [Cappa] 1411—ab
  fellowship in medical neoplasia, N. Y., 794
  in Children: See Children
  intestinal, causing intussusception, India, 1393
  malignant, with effusion, effect of prednisone in, [Franco & others] *1645
  mediastinal, azygos vein dilatation simulating, [Shuford] 971—ab
  metastases, needle biopsy of liver in, postbiopsy mortality in, [Fisher] 1811—ab
  metastases, pulmonary, operative treatment, [Hansen] 1815—ab
  metastases, to liver, differential diagnosis, Austria, 1797
  metastatic embryonal rhabdomyosarcoma in growing skeleton, [Caffey] 123—ab
  of anterior mediastinum, [O'Gara] 223—ab
  pituitary, ACTH-producing, [Nelson] 1158—ab
  Polypous: See Polyps
  removal from right atrium under hypothermia, [Krčilková] 2062—ab
  salivary gland, treatment, 2333
  trophoblastic, folic acid and purine antagonists for, [Li] 1416—ab
  trophoblastic, related to choriocarcinoma, in women, chemotherapy of, [Hertz & others] *845; 894—E
  vascular; management, [Stephenson] 1711—ab
TWINS
  identical, kidney transplanation between 7 pairs, [Murray] 2190—ab
  smoking genotypes, United Kingdom, 212
TWITCHING
  of eye, constant, cause, treatment, 982
  signs and symptoms in chronic renal failure, [Effersøe] 214—ab
TYPHOID booster immunizations, interval between, 2334
TYVID: See Isoniazid

U

ULCERS
  chronic, of legs; tetanus and, [Riis] 1700—ab
  Hunner's, [Kinder] 2320—ab
  neurotrophic, of feet, 47 cases, [Kelly & Coventry] *388
  premenstrual herpetic [illegible] ns, (reply) [Houk] 844
alth, 296
ULTRAVIOLET RAYS
  ner division inhibitio
  [illegible] 997

UNDULANT FEVER: See Brucellosis
UNIONS: See Industrial Trade Unions
UNITED MINE WORKERS OF AMERICA
  A. M. A. annual reports on, 1066; 1109; (action on resolutions) 1110
  A. M. A. conference with, 1110
  relationship of medical profession to administrators of medical care plan, (supplementary report) 56; (resolutions on) 66
UNITED NATIONS
  international conference on peaceful uses of atomic energy, WHO report, 929
UNITED STATES
  Air Force: See Aviation, U. S. Air Force
  Bureau of the Budget, estimates of costs for military care by, 1662
  Citizens: See also American citizens
  citizens studying medicine abroad, 1522; 1523
  Congress: See Laws and Legislation, federal
  consolidate Federal Civil Defense Administration and Office of Defense Mobilization, 1070
  Department of Agriculture with Department of Health, Education, and Welfare, pilot projects in economically depressed areas, 1051
  Department of Defense reorganization, annual report on, 1069
  Department of Health, Education, and Welfare, advancement of medical research and education through, 1483
  government agencies, A. M. A. cooperative relationships, 1079
  government employees, medical care for, annual report, 1104
  government mass pest control programs, health hazards to humans and wildlife from, 1061
  government participation in medical care for indigent in 1958, (Council report) 2151
  government study of optimal birth weights, New York City comments on, [Baumgartner] 1154—C
  medical-health spending for 1959, 1452
  Office of Vocational Rehabilitation contributions to medical education and research, 1530
  participation in local medical societies by physicians employed by, 58
UNIVERSITY
  of Alabama, grants for new psychiatric clinic at, 2028
  of Arkansas, (grant for training researchers) 74; (clinical research wing at medical center) 417; (Virus Research Laboratory) 2277
  of Buffalo School of Medicine, (research wing dedicated, photo) 792; (joint study with School of Education) 1461
  of California, (new Cardiovascular Research Institute) 1380; (medical school consolidates in San Francisco) 2155
  of Chicago, (Home for Incurables affiliates with) 197; (postdoctoral statistics awards) 297
  of Cincinnati, study relationships between speech and personality characteristics, 1560
  of Colorado, (faculty, research grants for study on muscular dystrophy and heart surgery) 1239; (grant to for research facilities) 2028; (emergency civil defense hospital unit) 2155
  of Florida College of Medicine, (grants to) 197; 790; 1666 (new department of pediatrics) 1666
  of Illinois, (expansion program in Chicago) 198; (brain chemistry research) 1139
  of Miami School of Medicine, USPHS grant for equipment for research building, 197
  of Michigan, (exchange program for interns and residents) 791; (hospital services; testimonial to veteran teachers) 909; (Division of Gerontology) 1102; (public health research and training) 1240
  of Minnesota, surgical travel fellowships, 1382
  of Mississippi School of Medicine, construction of student housing begun, 1240
  of North Carolina School of Medicine, grant for program of development, 75
  of Oregon Medical School, grant for research building at, 1911
  of Pennsylvania, (March of Dimes awards to) 1383; (Bockus International Society of Gastroenterology organized by graduate alumni) 1560; (gift for radiology center) 1912; (dedicates School of Allied Medical Professions, research building construction) 2279
  of Pittsburgh, (established health law center) 295; (plans experimental program of medical education) 1467
  of Tennessee, (study effects of exposure to low amounts of radiation) 1561; (new research installation at) 1667
  of Texas Postgraduate School of Medicine, Medical Cruise to Caribbean, 1142
  of Utah Medical Center planned, 1912

UNIVERSITY—Continued
  of Washington, (Dr. Wagner appointed. Cardiovascular Research Chair) 167: 18 Aug. 9, 1958; (correction) 168: 202, Se 13, 1958; (new internship and reside program) 296; (faculty teaching conf ence) 1466
  of Wisconsin, (cosponsors sympo[illegible] bone, program) (council symposium) 52 (30 year experiment with preceptorshi 1466
  State U. of New York (Downstate Medi Center, new department of rehabilitat medicine) 1667; (Upstate Medical Cent reconstructed Basic Science building) 1
  Universidad del Vallee at Cali, new medi school, Colombia, 1391
URETERS
  amyloidosis, primary, [Andreas] 466—ab
  duplication and ectopia, clinical importa [Thompson & Amar] *881
  duplication, bilateral complete, [Powell] —ab
  idiopathic retroperitoneal fibrosis involvi [Hackett] 1707—ab
  role in pathogenesis of ascending pyelone ritis, [Talbot] *1595
  vesicoureteral reflux in children, [Jones] 1 —ab; (significance) [Politano] 1821—
URETHRA
  diverticulum, perineal; complication of is um removal, [Comarr & Bors] *2000
  rupture, management of severely inju patient, [Schulte] *2094
URIC ACID in Blood: See Blood
URINARY SYSTEM
  calculi, prevent after paralytic poliomyeli [Plum] *1302
  infection in children, persistent and rec rent, [Forsythe] 2320—ab
  obstruction, acute renal failure and gener ized abdominal pain, (Diagnostic Problem [Kushner & Szanto] *1778
  tuberculosis, latent, Belgium 307
URINATION
  incontinence not always present in urete duplication and ectopia, [Thompson Amar] *881
  incontinence, water treatment, 1836
URINE
  Δ-aminolevulic acid and porphobilinogen different types of porphyria, [Haeger] 2 —ab
  Blood in: See Hematuria
  calcium and inorganic phosphate in patie with calcium stone of renal origin, [H kinson] 1820—ab
  chorionic gonadotrophic hormone excret after chemotherapy of choriocarcinoma a related tumors, [Hertz & others] *845; —E
  diastase, hyperdiastasuria and acute panc titis after partial gastrectomy, [Wallenst 1708—ab
  electrolyte excretion, effect of chlorothiaz on, [Lassen] 2196—ab
  foaming, cause, 1837
  Glucose in: See Glycosuria
  high production to prevent urinary cal after paralytic poliomyelitis, [Plum] *1
  5-hydroxy-3-indole acetic acid in functi ing carcinoids, [Sauer & others] *139
  17-ketosteroids in leishmaniasis, India, 20
  porphobilinogen in acute intermittent phyria with respiratory paralysis, [Do others] *1973
  studies, metabolic and biochemical changes normal pregnancy, (Council article) [Mac *2265
  Sugar in: See Glycosuria
  virus in, in Coxsackie B virus infecti [Utz & Shelokov] *264
  water and electrolyte excretion in p eclampsia, chlorothiazide effects on, Alvarez & O'Lane] *2226
  yeast in, significance, (replies) [O'Conor original consultant] 474
UROLOGY
  American, obligation to world, [Barnes]
  essentials for residency training in, report, 1099
URTICARIA
  after trauma, cause, treatment, 1837
UTERUS
  abnormalities, hypofibrinogenemia relation 2085
  adnexa, bacterial lipopolysaccharides for flammation of, [Fricke] 1273—ab
  bleeding and vaginal cytology, India, 2292
  bleeding, functional, 17-alpha-hydroxypro gesterone caproate for, [Zorn] 1274—ab
  cervix, advantages of cold conization: instrument, [Fleming] *886
  cry in: vagitus uterinus, [Iklé] 459—ab
  endocervicitis and sterility, Brazil, 802
  prolapse, estrogens in, [Anderson] *173
UTERUS CANCER
  cytological screening through physicians' fices, 63,163 examinations, [Calabrese others] *243